A Site Inspection Follow-up

of

The Pigeon Point Landfill

PA/SI Cooperative Agreement Grant No. V-003350-01-0

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BLS7508S
March, 1988

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I. INTRODUCTION

Pigeon Point Landfill

Expanded Site Investigation Report

I. Introduction

A. Scope of Work - This report includes an expanded assessment of the contamination of groundwater at the Pigeon Point Landfill site and, as a result, the potential contamination of existing and/or future well water supplies and surface waters (to which the contaminants in groundwater could migrate). This assessment was undertaken as a result of the Pigeon Point Landfill being proposed for the National Priorities List on the basis of alleged contamination of groundwater samples from monitor wells screened in an aquifer which is used nearby for public and industrial water supply.

B. Summary. The Pigeon Point Landfill is located in New Castle County, Delaware, adjacent to the Delaware River just north of the west-bound span of the Delaware Memorial Bridge. The site consists of 187 acres on which mixed municipal and industrial wastes were disposed between 1970 and 1985. Prior to 1968 the site was used for disposal of dredge spoils pumped from the Delaware and Christina Rivers. After the site was closed in 1985, the landfill received a final soil cover and was vegetated with methane-tolerant grasses. Groundwater monitoring of several water-yielding horizons indicated that contaminants--possibly related to the landfill were present in the subsurface. Water from monitor wells constructed in Potomac sands on the Pigeon Point Landfill site reportedly contained the priority pollutants arsenic and benzene. The sand members of the Potomac Formation are the source of water for several public and industrial water supply wells within one mile of the Pigeon Point Landfill.

The analytical data indicating contamination of groundwater by arsenic and benzene were of questionable validity. Therefore, in September 1987 the monitor wells screened in the Potomac Formation were resampled for full priority pollutant analysis. The results indicate that the groundwater in the Potomac at the landfill site are not contaminated with priority pollutant compounds. However, the water from the shallowest Potomac sands has concentrations of sodium chloride, iron and/or alkalinity which would be objectionable for water supply purposes. These contaminants may have been derived from a variety of possible sources including seasonally brackish Delaware estuary, and/or its tidal tributaries or wetlands, naturally occurring, related to earlier dredge spoil disposal and/or uncontrolled landfilling, and/or influenced by the current landfill. Naturally aerobic conditions and brackish water intrusion from the tidal marshes and - possibly - of early dredge spoil disposal are the most likely sources of these contaminants.

The Pigeon Point Landfill does not appear to be impacting or pose a threat to existing or potential water supplies. However, monitoring in accordance with State of Delaware regulations for solid waste facility closure should be continued.

II. SITE HISTORY

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II. Site Description

A. Location, Layout, Area. The Pigeon Point Landfill is located in New Castle County, Delaware adjacent to the Delaware River and immediately north of the Delaware Memorial Bridge. The site location is shown in Figure 1. The site consists of 120 acres of landfill on a property which comprises 187 acres.

Several public and industrial water supply wells are located within a mile of the Pigeon Point Landfill as shown in Figure 2.

B. Site History, Ownership. The site now occupied by the Pigeon Point Landfill was apparently almost all tidal wetland on the edge of the Delaware estuary (U.S.G.S., 1964). This wetland was drained by several small streams--the largest and only one with a known name being Magazine Ditch--which discharged into the estuary. Figure 3 is a copy of a map showing the site as a wetland/marsh prior to disturbance by human activity.

Dredge spoiling was conducted by the U.S. Army Corps of Engineers from the mouth of the Christina River sequentially southward on land fronting the Delaware River. The area north and south of the Pigeon Point Landfill site received dredge spoils prior and subsequent, respectively, to Pigeon Point. Dredge spoiling was discontinued at Pigeon Point in 1960.

In 1969 or 1970, the City of Wilmington, which owned the property, began to use the Pigeon Point site for disposal of municipal trash. Waste was reportedly disposed of on the northeast and southwest portions of the property (filling at both ends and working towards the middle). In 1971, New Castle County took over landfilling operations of mixed municipal and industrial wastes which were generated throughout the county. In 1981, the newly formed Delaware Solid Waste Authority (DSWA), based on an agreement with New Castle County and the City of Wilmington, took over the landfilling operations at Pigeon Point.

In 1985, the landfill was completed. Landfilling operations shifted north to Cherry Island and landfilling operations at Pigeon Point ceased. The DSWA has conducted post closure monitoring since 1985 and the property ownership has reverted to the city of Wilmington.

C. Permits, Regulatory Actions. The Pigeon Point Landfill was the first landfill to be scrutinized by the Delaware Department of Natural Resources and Environmental Control (DNREC) after it was created in 1971. DNREC required that the landfill have a liner and leachate collection system as a permit condition. (These requirements were later incorporated in the Delaware State Solid Waste Disposal Regulations which were adopted by DNREC in 1974). The landfill permits issued by DNREC also required monitoring of groundwater quality. The permit for landfilling was transferred by DNREC to DSWA in 1981 and subsequently re-issued annually.

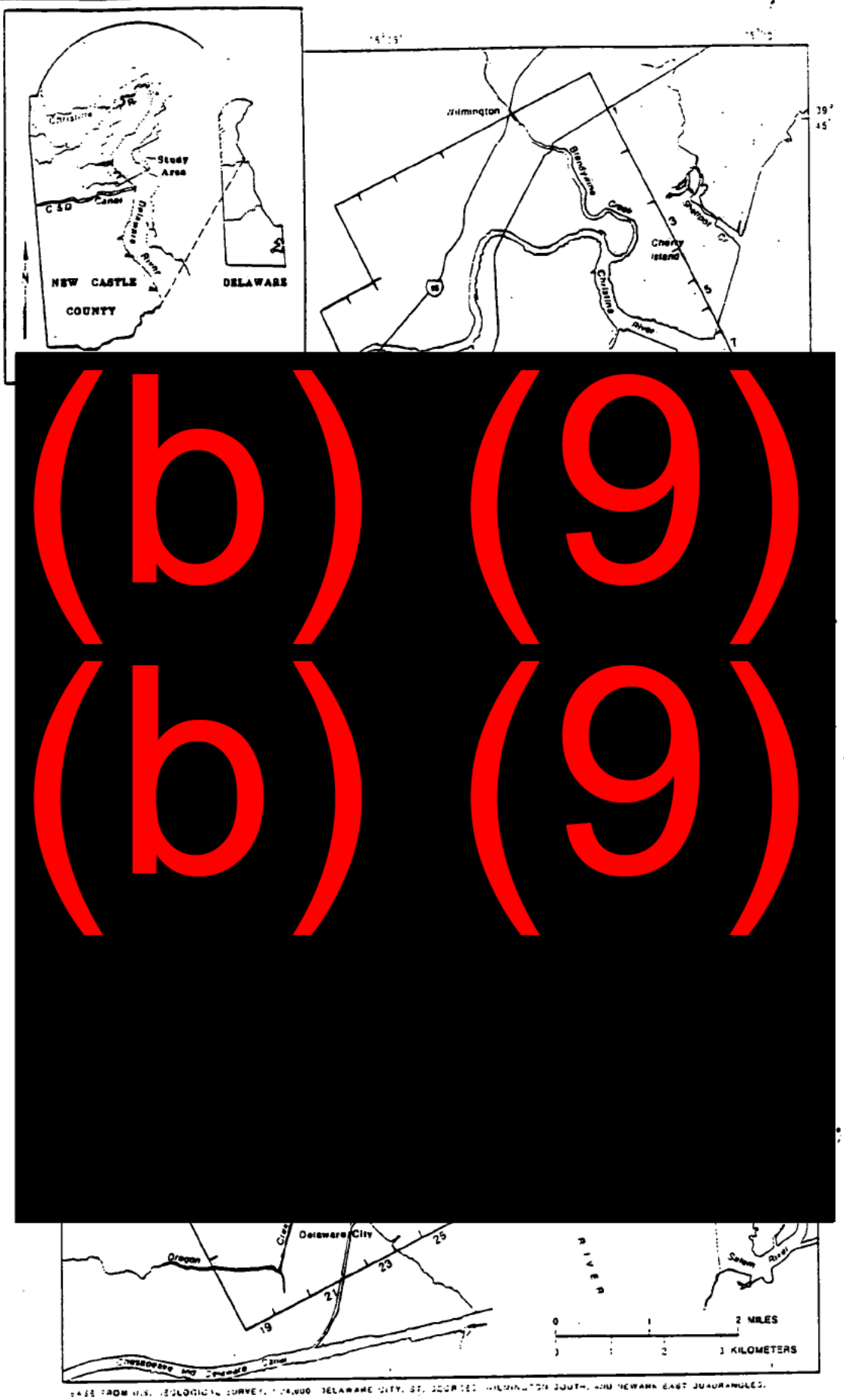

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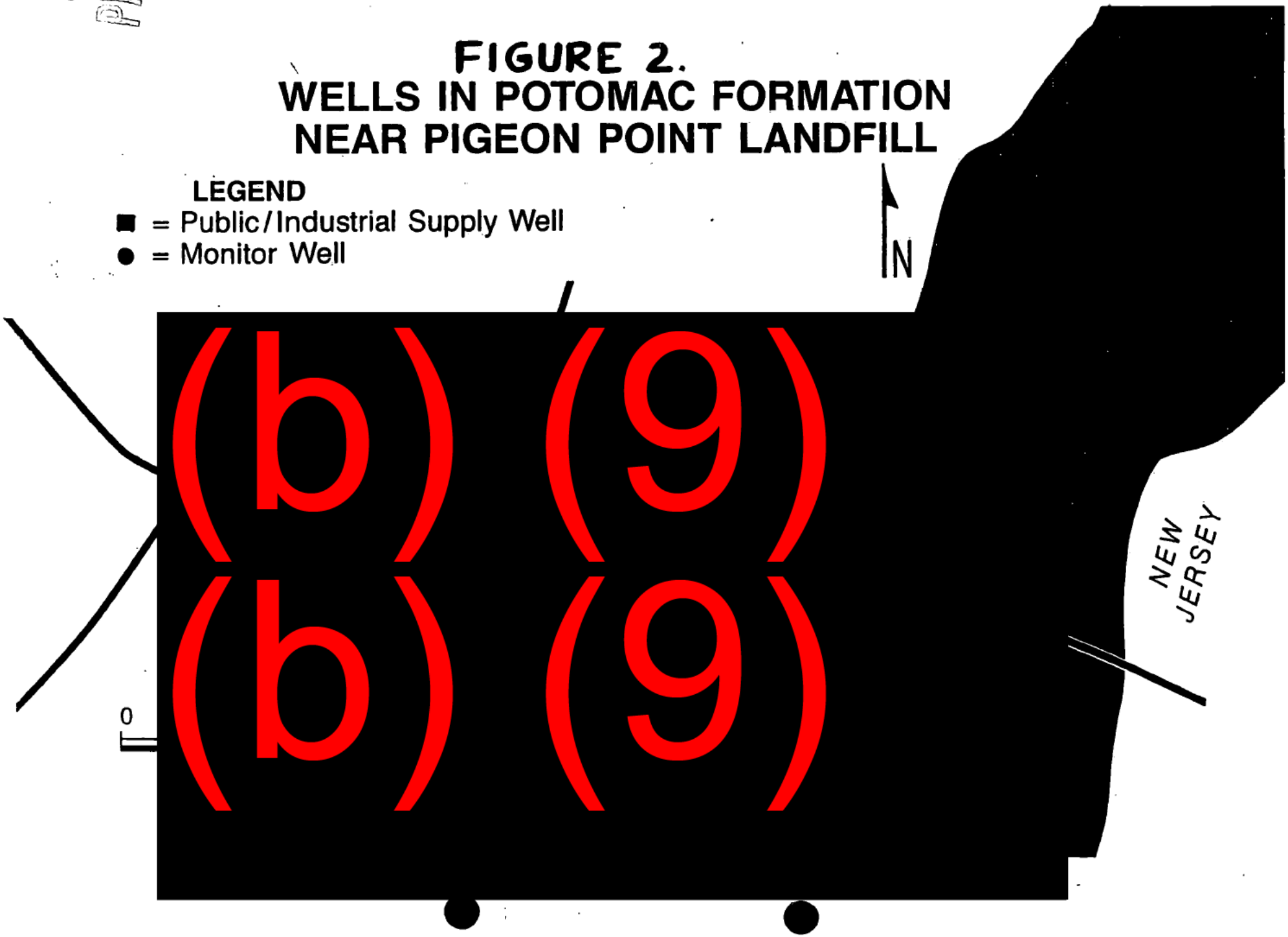
Figure 1. Location of Pigeon Point Landfill

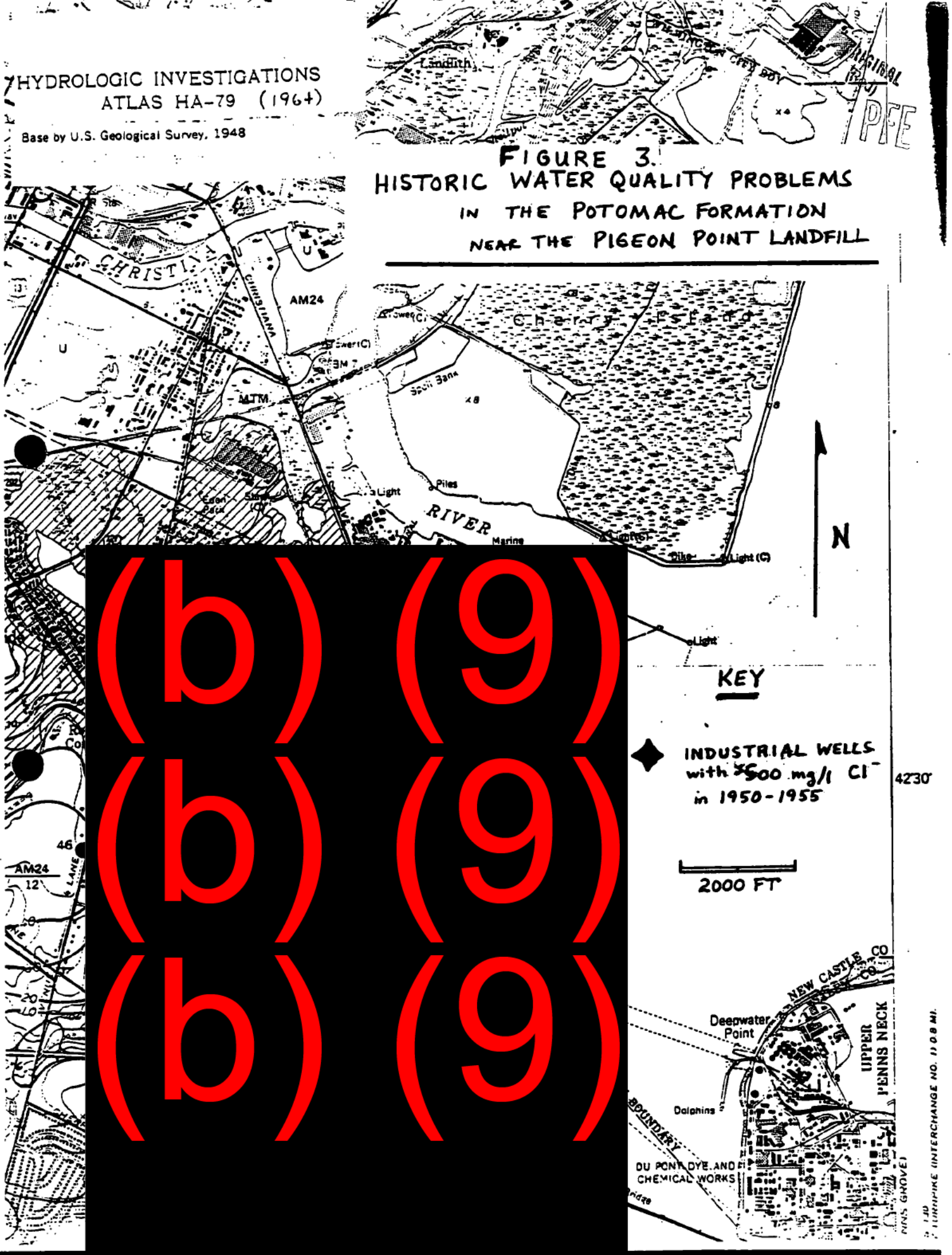
FIGURE 2.
WELLS IN POTOMAC FORMATION NEAR PIGEON POINT LANDFILL



HYDROLOGIC INVESTIGATIONS
ATLAS HA-79 (1964)

Base by U.S. Geological Survey, 1948

FIGURE 3.
HISTORIC WATER QUALITY PROBLEMS IN THE POTOMAC FORMATION NEAR THE PIGEON POINT LANDFILL



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In 1985, DSWA filed a closure plan which was approved by DNREC. Monitoring data on groundwater quality has been submitted quarterly to DNREC by DSWA in accordance with this closure plan.

D. Remedial Actions. The Pigeon Point property was diked with natural aggregate material by the Corps of Engineers to contain dredge spoils. Natural drainage was diverted both north and south (but mainly south through Magazine Ditch) of the spoil area. The dredge spoils were pumped as a watery slurry from the river through a pipeline into the diked area. The dredge spoils consisted mainly of fine sand, silt and clay which settled in the diked area; the supernatant water was allowed to flow through an overflow outlet back to the Delaware River. Dredge spoil disposal continued until the dredge spoil sediments accumulated to a depth of 8 to 10 feet.

Landfill leachate collection drains consisted of plastic-lined gravel-filled trenches. Beginning in 1974, they were installed beneath the areas remaining to be landfilled at Pigeon Point by New Castle County. These drains conduct leachate to a peripheral ditch system which was connected to the New Castle County regional sewage system by 1980. (Prior to that time, leachate seeped from and occasionally discharged directly over or through the dike to the Delaware River). Subsequent to 1981, DSWA spent approximately $3.5 million on changes to the leachate collection system including installation of new drains and extension of the system around the entire periphery of the landfill. Additional pump and lift stations were constructed to remove accumulated leachate promptly to the sewer system. In 1985, DWSA provided final cover and vegetation to the landfill for closure. Maintenance of the landfill cover in response to settlement and erosion has continued since that time.

III. ENVIRONMENTAL SETTING

III. Environmental Setting

A. Geology. The Pigeon Point Landfill site is located in the Atlantic Coastal Plain. The coastal plain is underlain by a seaward-thickening wedge of unconsolidated sediments which are deposited on a weathered crystalline bedrock surface. This bedrock outcrops along the Fall Zone, about 15,000 feet to the northwest in the City of Wilmington. Weathered bedrock has been encountered in test borings at approximately 270 feet below land surface near the southwest corner of the site. Several different sedimentary units underlie Pigeon Point. These ranging in age from oldest to youngest, and, therefore, from deepest to shallowest are the Potomac Formation, the Columbia Formation, Recent alluvium and marsh sediments, and dredge spoil deposits. A geologic cross-section indicating the relationship between these units drawn west-east across the southern boundary of the Pigeon Point Landfill is shown in Figure 4.

The Potomac Formation is a Cretaceous Age non-marine fluvial deposit. It consists mainly of unconsolidated silts and clays which are interbedded with fine to medium textured sands. The sands were deposited in and along the channels of ancient relatively sluggish streams. These sands occur as lenses and stringers and are limited both laterally and vertically in extent and continuity.

Relatively thick sand members of the Potomac Formation yield several hundred gallons per minute of water to both public and industrial supply wells within a mile of the Pigeon Point Landfill. The top of the Potomac Formation occurs from about sea level to 50 feet elevation and is, therefore, at least 200 feet thick beneath the landfill.

The Columbia Formation is a Quaternary (Pleistocene) Age fluvial deposit. It consists generally of fairly well to poorly sorted fine to a textured sands. Finer-grained lenses of sandy or clayey silt occur in the Columbia Formation, but are generally not more than a 10 feet thick or laterally extensive for more than a hundred feet. The Columbia sediments were deposited in channels eroded by streams into the older, underlying Potomac sediments. This erosion occurred during the Pleistocene Epoch when sea level was several hundred feet lower than at present. These channels were backfilled with generally coarse sediment from swift glacial melt water streams as sea level rose. The Columbia Formation is 20 to 30 feet thick along the northern boundary of Pigeon Point Landfill property. The Columbia has apparently been removed by recent erosion and is absent beneath the southern half of the Pigeon Point site.

The Recent sediments are generally fine grained poorly sorted silts with significant amounts of clay and fine sand. They are the result of deposition by slow currents and low stream gradients along a submerged coastline. The depositional environment of the recent sediments was characteristically tidal marshland and the sediments contain a substantial amount of organic vegetative matter. These natural Recent deposits range from up to 50 feet thick beneath the Pigeon Point Landfill.

The uppermost sediments at Pigeon Point consist of the material dredged from the Delaware and Christina Rivers by the Corps of Engineers. This dredging was performed to maintain the shipping navigational channels and nearby port facilities. The dredge sediments, which underlie virtually the entire Pigeon Point Landfill, are generally fine sands, fine sandy silts or clayey silts. The dredge spoil sediments are absent beneath the northwest and southwest corners of the landfill, but otherwise are from 8 to 10 feet in thickness. A fence diagram showing the thickness and elevation of each geologic unit beneath the Pigeon Point Landfill is shown on Figure 5.

B. Hydrology. The Pigeon Point area has been the subject of geohydrologic investigations for many decades, because of water supply development to the south and west and in response to water quality problems with these supplies - by brackish water and the potential for contamination by waste disposal activities.

1. Aquifers. The aquifers underlying the Pigeon Point area include unconsolidated sands of the Columbia Formation and of the Potomac Formation. According to a recently published U.S.G.S. report (Phillips, 1987).

> "The middle Potomac aquifer is the most important aquifer in the area between eastern New Castle and the Memorial Bridge...
>
> The middle Potomac aquifer underlies the river at the Memorial Bridge at a depth of 100 to 152' below sea level. The aquifer is continuous to the west, underlying the ICI and Collins Park well fields at a depth of 48 to 60 feet below sea level, with a thickness of about 20 to 30 feet. There is some question as to whether the sand unit underlying the ICI well field between 60 and 76 feet below sea level is the Potomac Formation or Columbia Group...
>
> Although this sand unit could be a paleochannel in the Columbia Group, it functions as part of the middle Potomac aquifer because of the overlying confining clay and hydraulic continuity with the Potomac sand at the Collins Park well field...
>
> The sand unit underlying the Collins Park well field at 48 to 60 feet below sea level is the Potomac Formation...
>
> North of the Memorial Bridge, the Potomac Formation is mostly fine grained, containing relatively thin and

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FIGURE 4.

NORTHERN SOLID WASTE FACILITY—PIGEON POINT LANDFILL

GEOLOGIC CROSS-SECTION

East to West (Modified from Phillips, 1987)

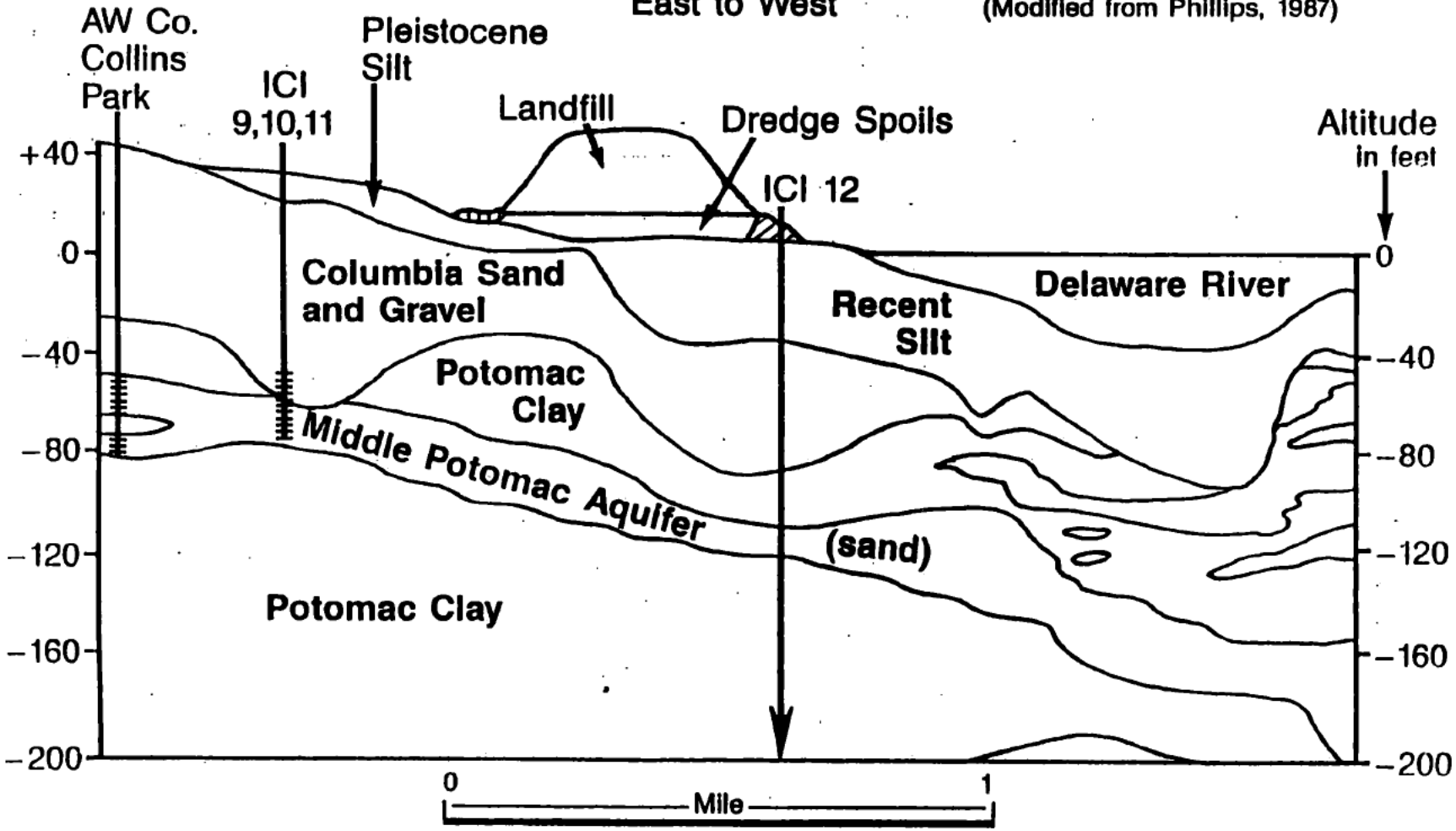

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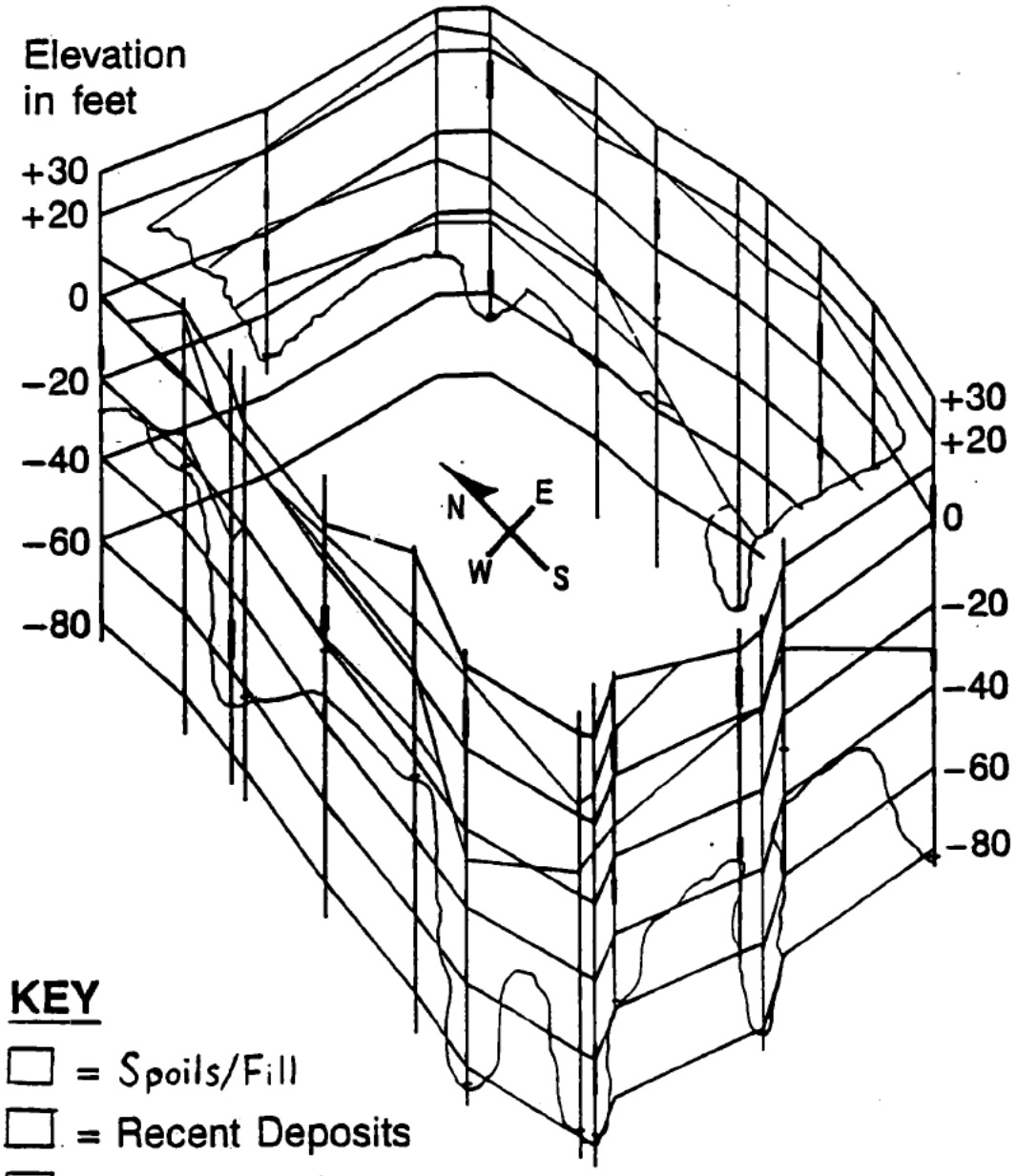
FIGURE 5.
FENCE DIAGRAM SHOWING GEOLOGY UNDER THE PIGEON POINT LANDFILL

(Modified from Duffield, 1987)



KEY

- ☐ = Spoils/Fill
- ☐ = Recent Deposits
- ☐ = Columbia Fm.
- ☐ = Potomac Fm.

discontinuous sand bodies. In general, the Potomac Formation lacks productive aquifers in the vicinity of Pigeon Point and Cherry Island."

Test borings into the Potomac Formation at Pigeon Point support these USGS conclusions. Only one of six test borings conducted through the horizon of the Middle Potomac Aquifer (-50 to -80 feet elevation) encountered any sand at all.

Therefore, only one monitor well (No. 45) is screened in the Middle Potomac Aquifer. The other Potomac monitor wells (Nos. 26R, 28, 29, 31, and 41) are screened in shallower relatively thin sands in the Potomac Formation above the Middle Potomac Aquifer.

The Columbia Formation itself is neither thick, deep or transmissive enough near Pigeon Point to function as an aquifer for public or industrial water supply. However, a relatively thick buried channel containing sand parallels the western boundary of Pigeon Point and the channel sand may be part of the aquifer exploited at ICI and Collins Park well fields southwest of the landfill.

The lower Potomac Aquifer occurs at approximately -200 feet elevation. It is the source of water for ICI's well 12 (located a few hundred feet southeast of the Pigeon Point landfill). The lower Potomac Aquifer is tightly confined and does not communicate hydraulically with the Middle Potomac Aquifer near Pigeon Point. The Lower Potomac has a relatively low transmissivity, but the available drawdown supports a continuous withdrawal of 200 gallons per minute. Geophysical logs prepared when the well was installed indicated that the base of the Potomac contains brackish water (Kenneth D. Woodruff, Assistant Director DGS to M.A. Apgar, 1988). Because of the extensive drawdown created by well 12 (and the threat of natural brackish water contamination) no additonal water supply development in the lower Potomac near Pigeon Point appears likely.

2. <u>Hydraulic Properties</u>

The variability in the characteristics of the sediments in the Pigeon Point area result in a wide range of hydraulic properties which affect the subsurface movement of water and contaminants. These hydraulic properties (hydraulic conductivity, transmissivity, effective porosity and storativity) are functions of the lithology, thickness, lateral extent, and degree of interconnection of sand bodies within a localized area.

The U.S.G.S. developed a groundwater flow model of the Potomac aquifers which is documented in report (Martin, 1984). A basic data report prepared as part of the USGS study (Martin and Denver, 1982), reported transmissivity values of 454 to 8,480 feet ^{2}/day from analysis of aquifer tests of the middle Potomac Aquifer.

The average hydraulic conductivity of the middle Potomac sands was 25 feet/day. The transmissivity beneath the Memorial Bridge was about 1500 feet^2/day, decreasing northward to less than 500 feet^2/day beneath the Pigeon Point Landfill. Storage coefficients in the Potomac aquifers range from 5.6×10^{-5} to 3.8×10^{-3} (Martin and Denver, 1982, p. 15). An average value of 5.6×10^{-4} was used by in the USGS flow model of the Potomac aquifers (Martin, 1984).

The fine-grained sediments of the Potomac, which comprise the bulk of the formation, function as confining units for the sand aquifers. Values of vertical hydraulic conductivity for these sediments reported by U.S.G.S., the Corps of Engineers (for USGS) and other investigators ranged from 4×10^{-5} to 3×10^{-11} feet/sec. Generally, the fine-grained sediments have vertical hydraulic conductivities of 10^{-7} cm/sec. or less. Water movement occurs through sandy interconnections between aquifiers, rather than through these dense silty clays.

The Columbia sediments are generally sandy, with hydraulic conductivities of 25 to 75 feet/day. The Columbia sediments beneath the Pigeon Point Landfill are either confined by fine-grained esturarine sediments of Recent age or absent. The limited extent and thickness, limited available drawdown and demonstrated local (at ICI) hydraulic connection with brackish water on the Delaware Estuary has precluded the use of the Columbia Formation as a source of water supply near Pigeon Point.

Recent sediments and hydraulically placed dredge spoil materials lie directly beneath the surface, or the landfill, at Pigeon Point. These two layers, which form the base for the landfill, are a 20 to 50 feet thick wedge of fine-grained sediments (>90% clay-silt), which are highly compressible, and have a vertical hydraulic conductivity less than 10^{-7} cm/sec (Richardson Associates, 1973).

The permeability of this landfill basal material was anticipated to decrease with time because of compaction caused by the weight of refuse. An estimated 5 feet of settlement was predicted over a 40 to 50-year period as pore water is squeezed out of these sediments. This landfill subbase should prevent significant vertical migration of landfill leachate to underlying sediments.

C. <u>Groundwater Flow Patterns</u>. Under natural (pre-pumping) conditions, groundwater discharged into the tidal marsh and estuary from the sands in both the Columbia and Potomac Formations. The distribution of hydraulic head which existed in the unconfined sediments prior to landfilling is shown in Figure 3. However, both local and regional pumpage has lowered the hydraulic head in the aquifers below that of the river. In fact some brackish water is now induced to infiltrate from the tidal tributary streams of the Delaware estuary, both of which overlie permeable deposits, which are eroded into the Potomac sediments. The configuration of the potentiometric surface in the middle Potomac aquifer, the major source of public and industrial water supply in the area, is shown on Figure 6.

FIGURE 6.
POTENTIOMETRIC SURFACE
IN THE MIDDLE POTAMAC AQUIFER
NEAR THE PIGEON POINT LANDFILL - 1985
(from Phillips, 1987)

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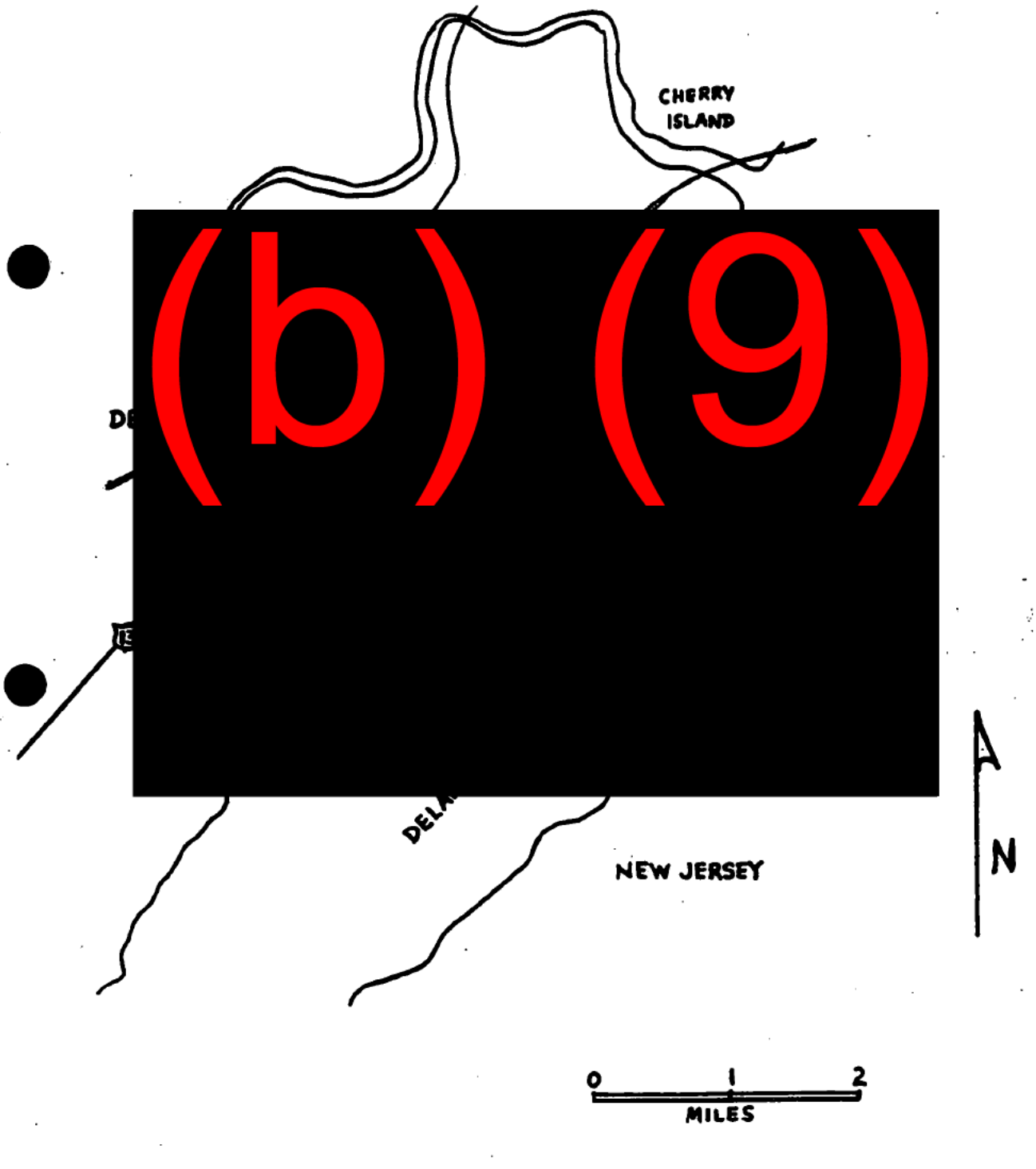

The deposition of refuse has been accompanied by development of a groundwater mound which, according to piezometers in the landfill, may be up to 40 feet above sea level. However, the actual hydraulic head at the base of the landfill is in doubt because of likely local perched water conditions in the trash. Although water levels in wells screened in the trash indicates substantial saturation, the absence of side seeps or leachate springs suggests that these high water levels are not representative of the actual degree of saturation (Glenn Elliott, personal communication, 1988). Nonetheless, hydraulic gradients today are both radially away from the landfill in the unconfined aquifers and vertically downward toward underlying aquifers.

Groundwater elevation data is generated quarterly in monitor wells around the Pigeon Point Landfill by the DSWA. A tabulation of this data is presented as Table 1. A map showing the distribution of hydraulic head in the uppermost Potomac sands beneath Pigion Point from these data are shown in Figure 7. Groundwater flow in the shallowest Potomac sands - to the extent that these sands are continuous and flow directions can be interpreted from distribution of hydraulic head - is southeastwards toward the Delaware River. The hydraulic head is beneath mean sea level elevation at the southeast corner of the property.

This indicates that pumping stresses in the Potomac have affected water levels in the uppermost Potomac sands and that this water will not, under current conditions, discharge to the river. However, a pumping test performed in 1977 by Delaware DNREC on ICI's wells resulted in no change in water levels in these shallow Potomac wells. This indicates that there is no direct hydraulic connection between the Middle Potomac Aquifer and the uppermost sands of the Potomac Formation beneath the Pigeon Point Landfill (Stoufer, 1977).

D. <u>Groundwater Quality.</u> Existing data on water quality in the Pigeon Point area spans three decades. These data were collected from water supply wells and also, since the 1970's, from groundwater monitor wells at the landfill. Water quality problems in the area were documented before Pigeon Point received either dredge spoils or solid waste. The locations of industrial wells which obtained water from sands in the middle Potomac or Columbia Formations and south of Pigeon Point where brackish water (>500 mg/l chloride) problems were documented in the early 1950s are shown on Figure 3. These wells were replaced by a public and/or deeper wells. Water drawn from the sands of the Columbia and uppermost Potomac also often contained objectionably high concentrations of iron. This iron was likely the result of anaerobic conditions created by the consumption of oxygen by naturally occurring organic matter in the sediments.

Currently, water withdrawals near Pigeon Point are from the Middle Potomac aquifer (perhaps including some sands of the Columbia Formations at ICI). Groundwater contains elevated concentrations of salt. Possible sources of this degradation include the Delaware River or associated tidal marshes and tributaries dredge spoil water, industrial effluent and leachate from landfills. According to U.S.G.S. (Phillips, 1987),

FIGURE 7.
PIGEON POINT LANDFILL
SHOWING MONITORING WELLS
AND POTENTIOMETRIC SURFACES
IN COLUMBIA AND POTOMAC
(MARCH 1987)

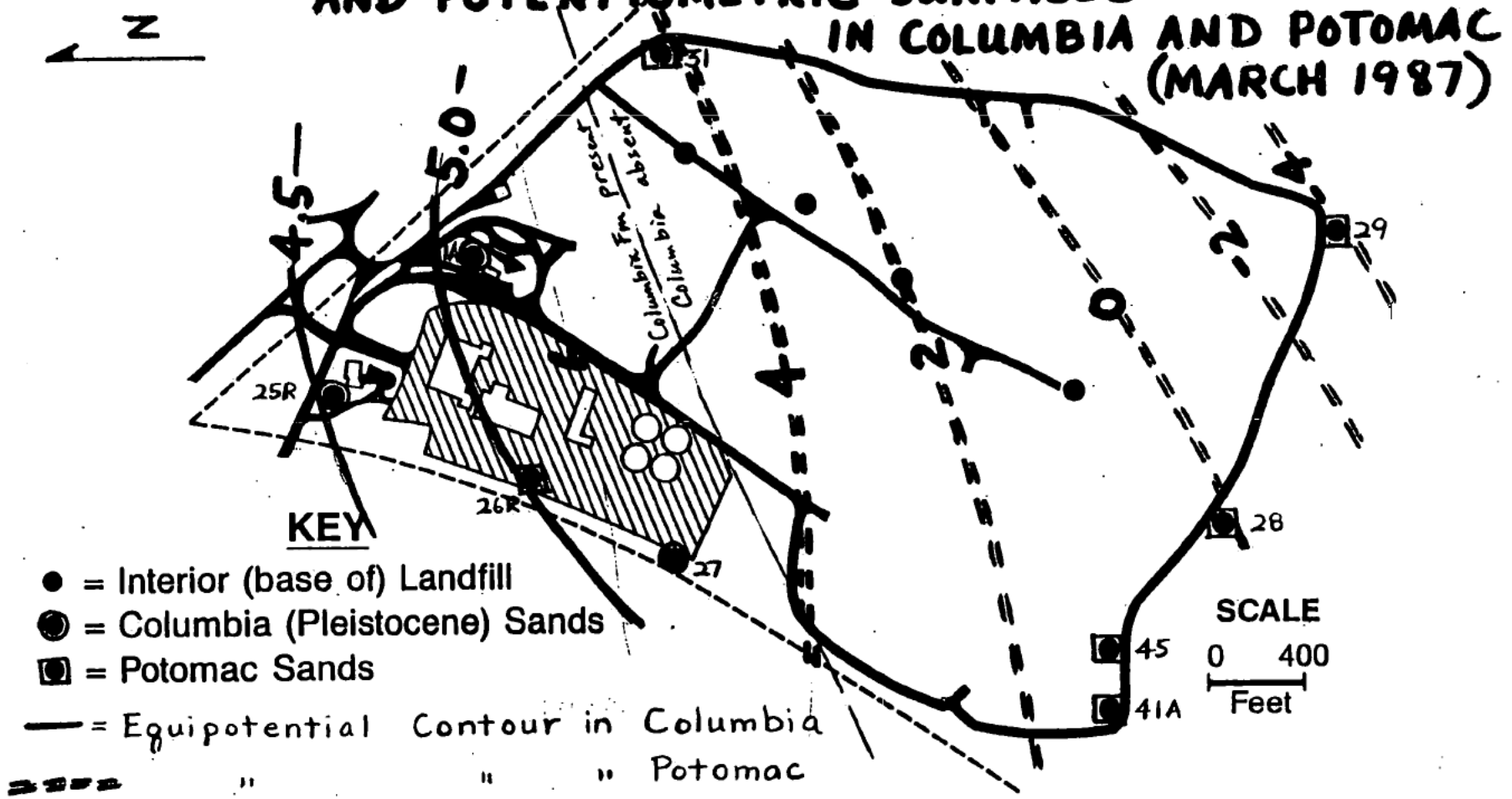

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TABLE 1

NORTHERN SOLID WASTE FACILITY-1

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GROUNDWATER ELEVATION (1) (2)
MARCH 1987

Monitor Well	Reference Elevations: Approximate Ground Surface Elevation	Reference Elevations: Reported Well Bottom	Measured Piezometric Elevation	Date (Time) Measured
Interior (Base of) Landfill				
47	66 ± ft.	---	37 ±	3/11/87 (13:30)
48	65 ± ft.	---	52 ±	3/11/87 (13:59)
49	65 ± ft.	---	22 ±	3/11/87 (14:10)
Recent Deposits/Dredge Spoils (Water-Table)				
1R	21 ft.	6.0 ft.	14.65	3/10/87 (9:05)
28A	16 ft.	1.0 ft.	11.75	3/10/87 (10:36)
29A	14 ft.	-0.9 ft.	10.3	3/10/87 (10:22)
31A	22 ft.	7.2 ft.	14.15	3/10/87 (9:30)
32A	18 ft.	2.75 ft.	13.05	3/10/87 (9:40)
39	14 ft.	-0.95 ft.	11.8	3/10/87 (10:29)
40	20 ft.	1.8 ft.	14.5	3/10/87 (11.04)
41	23 ft.	-1.7 ft.	2.7	3/11/87 (9:50)
42	18 ft.	1.5 ft.	7.85	3/10/87 (10:15)
52	19 ft.	3.4 ft.	15.75	3/10/87 (11:14)
Recent Deposits - Basal Zone				
24	30 ft.	-68.0 ft.	1.2	3/12/87 (15:30)
32	18 ft.	-11.65 ft.	11.3	3/10/87 (9:58)
42A	18 ft.	-22.35 ft.	7.2	3/11/87 (9:17)
52A	19 ft.	-22.9 ft.	17.75	3/11/87 (10:36)
Columbia (Pleistocene) Sands				
1A	21 ft.	-9.8 ft.	5.15	3/10/87 (9:08)
25R	9 ft.	-18.9 ft.	4.5	3/05/87 (11:51)
27R	8 ft.	-19.2 ft.	5.2	3/05/87 (11:21)
Potomac Sands (Undifferentiated)				
26R	10 ft.	-57.5 ft.	2.15	3/11/87 (11:15)
28	15.5 ft.	-35.55 ft.	0.8	3/05/87 (10:29)
29	13.5 ft.	-35.85 ft.	-4.3	3/05/87 (9:46)
31	23 ft.	-40.35 ft.	4.2	3/10/87 (9:29)
41A	23 ft.	-32.4 ft.	1.4	3/11/87 (9:36)
45	21.5 ft.	-67.85 ft.	-1.2	3/11/87 (10:00)

NOTES:

1) Piezometric elevation determined from measured depth to groundwater, referenced to top of casing elevation.
2) N.G.S. 1929 Sea Level Datum: Utilizing January 1985 revised reference elevation data.

W.O. 260B
Duffield Associates
18 March 1987

> "It is difficult to determine the sources of degradation because the historical pumpage has resulted in complex flow patterns. However, various data indicate that the predominant degradation source is the Delaware River and associated marshes and tributaries...
> The data indicates that pumpage at the Collins Park and ICI well fields has caused water levels in the Columbia aquifer under the Delaware River to fall below sea level. As a result, brackish water infiltrates downward from the river. This water is drawn towards the cone of depression in the middle Potomac aquifer and enters the aquifer where the Potomac confining unit is thin or nonexistent. The result is increased chloride concentrations in the ICI and Collins Park well fields."

Figure 8 shows the locations of water supply wells near Pigeon Point. Figure 9 shows a plot of chloride concentrations versus time in ICI's wells which are located in the Middle Potomac Aquifer, and perhaps also the Columbia Formation, immediately south of the Pigeon Point Landfill. The high concentrations of salt lag behind, but coincide with, high annual chlorinity in the Delaware River. Pumpage from ICI wells was decreased as a result in the mid-1970's.

Traditional approaches to comparing and evaluating the quality of water from different sources at Pigeon Point was performed by U.S.G.S. Stiff and Duror plots of analyses of water from the ICI and Artesian Water Company Collins Park wells drawing water from the Middle Potomac Aquifer within a mile of Pigeon Point "show a very strong similarity to brackish water in the Delaware River." (Phillips, 1987).

Pursuant to the Delaware DNREC permit (SW-84/17) and closure plan requirements, water samples at the Pigeon Point Landfill have been drawn from monitor wells in the landfill, the hydraulic fill (dredge spoils)/marsh sediments, Recent alluvium, Columbia Formation, shallow apparently thin, discontinuous sands in the Potomac Formation and the middle Potomac aquifer. The mass and variability of these data can be quite confusing. In order to compare and evaluate these data, a graph of the ranges and mean values for indicator parameters from each of the different hydraulic units was prepared.

The indicator parameters include COD, TOC, SPC, TDS, CI, TKN and alkalinity. For simplicity a plot of the mean values for these parameters are shown in Figure 10. The figure shows, that these indicator parameters are highest in the water samples obtained directly from the landfill. The concentrations of indicator parameters in water from the Recent alluvium, Columbia Formation, and shallowest Potomac sands are significantly lower and similar in relative proportion and absolute values to those from the Delaware River.

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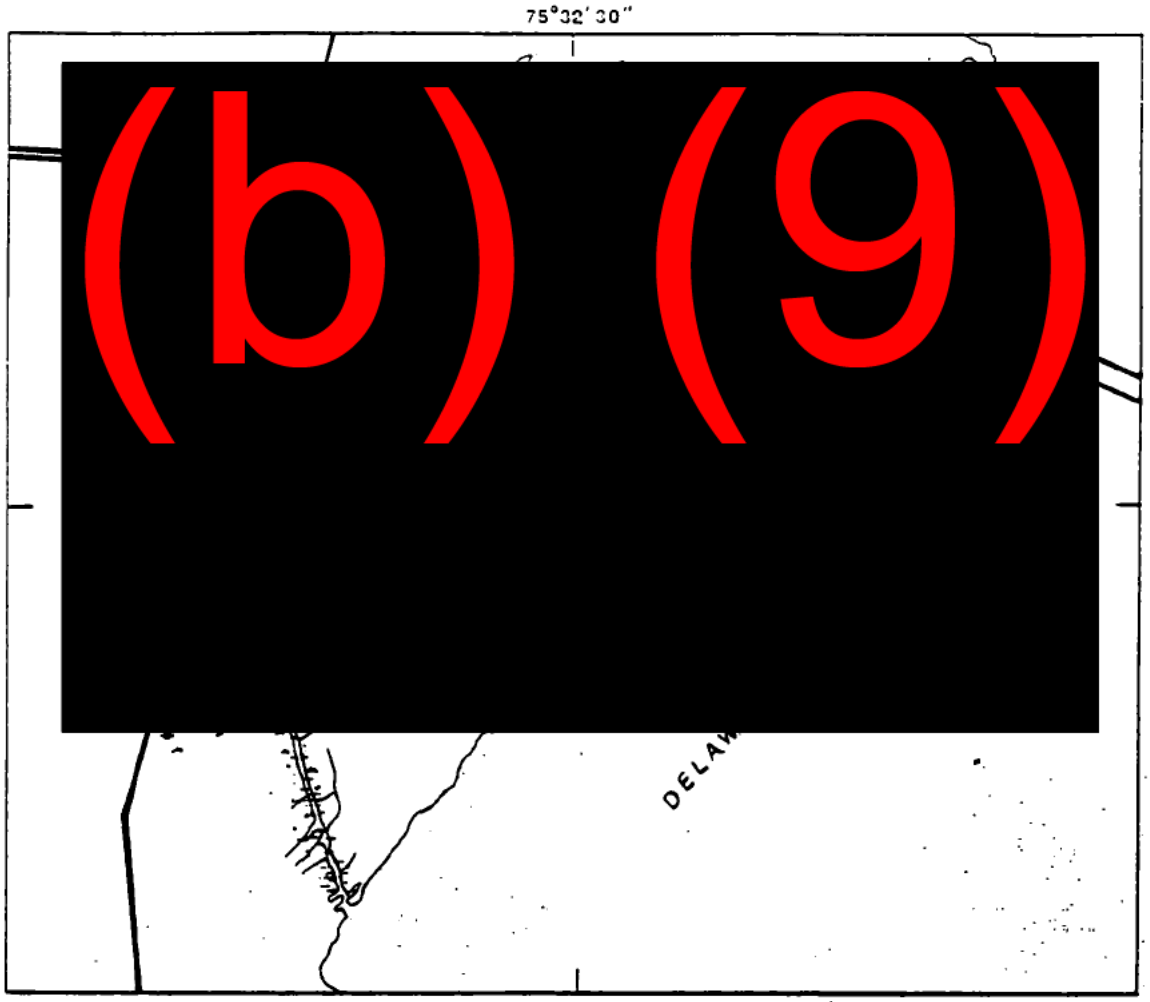


EXPLANATION

Cd 42-5 ● Well location and number in the middle Potomac aquifer

Cd 42-2 ○ Well location and number in the Columbia aquifer.

Figure 8. Location of production wells in the middle Potomac and Columbia aquifers at Collins Park and ICI Americas well fields.
(from Phillips, 1987)

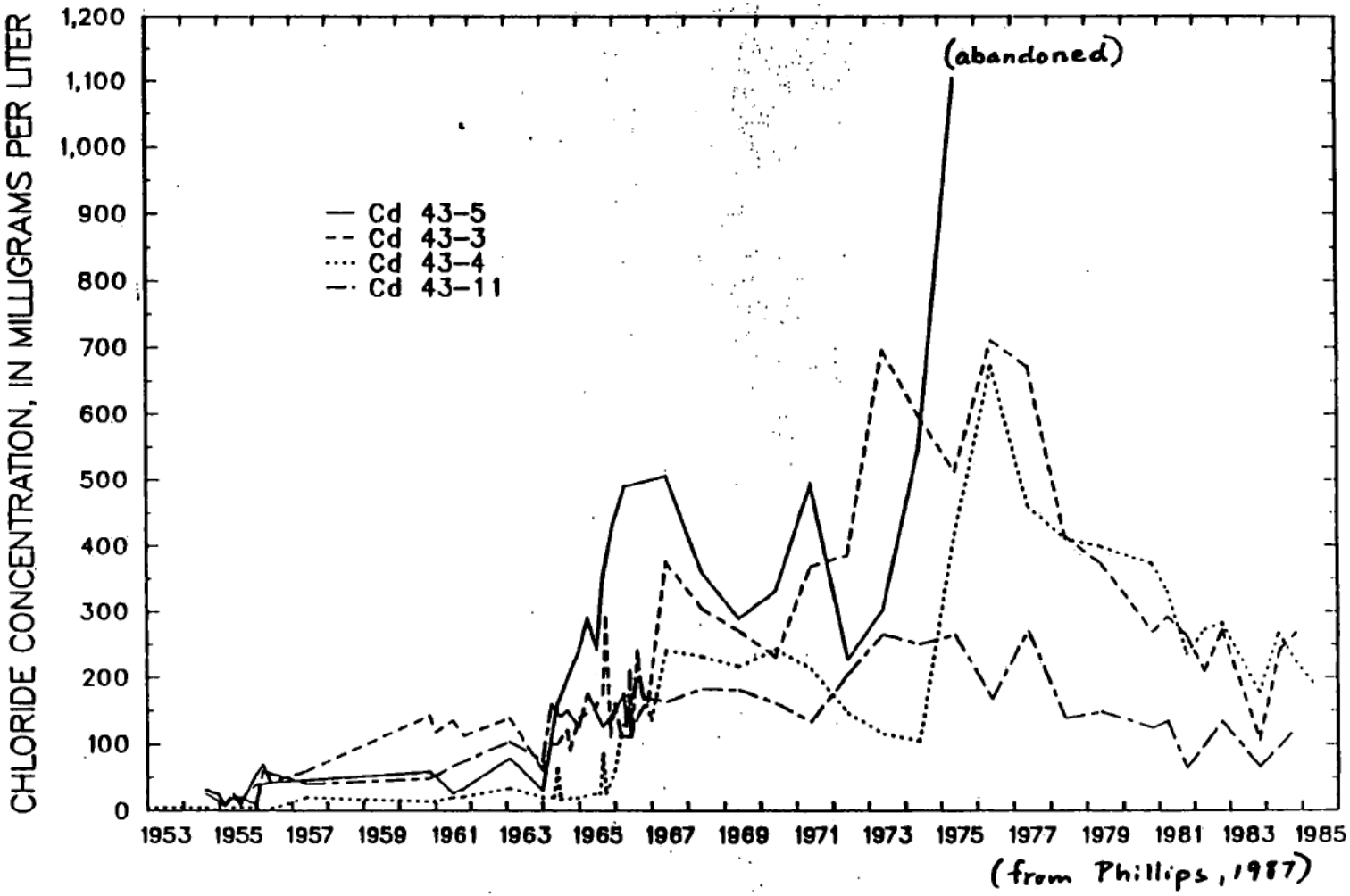


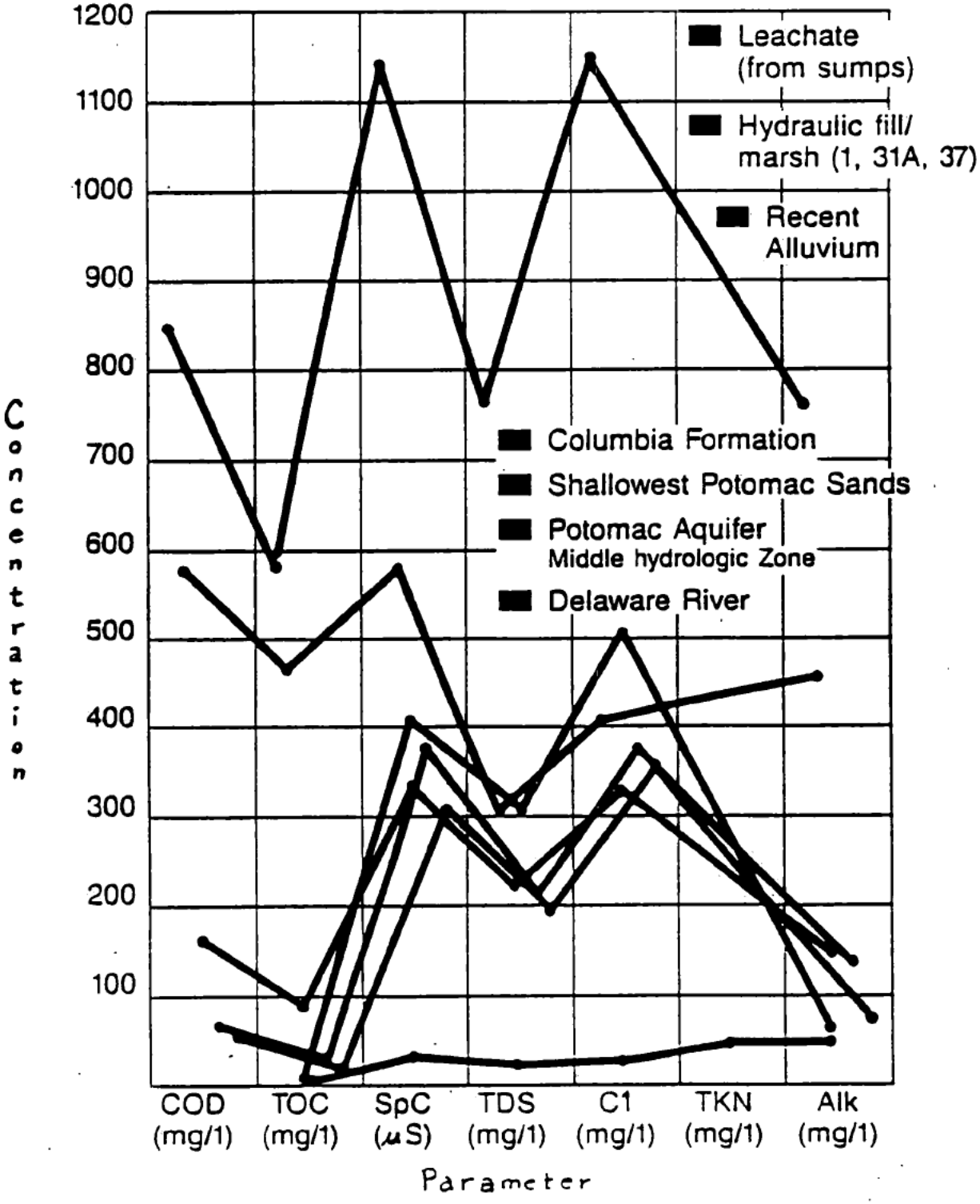
Figure 9. Change in chloride concentrations over time for wells Cd43-5, Cd43-4, Cd43-3, Cd43-11 in the middle Potomac aquifer, at the ICI Americas well field, 1954-85.

ORIGINAL (Red)

FIGURE 10.

PIGEON POINT LANDFILL

COMPARISON OF WATER QUALITY DATA



Groundwater from the Middle Potomac Aquifer beneath the landfill has good quality except for iron and is unaffected by either the river or the landfill. The high (5.9 ppm) iron concentration is likely naturally occurring.

Water from the hydraulic fill material has relatively high concentrations of organic compounds as indicated by COD, TOC, TKN, and alkalinity. These contaminants may be derived from naturally decaying vegetation in the sediments and/or leachate from the landfill, but probably both. This shallow contaminated groundwater drains to the landfill's peripheral leachate collection system and is removed for treatment in the regional sewer treatment.

Some groundwater quality monitoring data submitted by DSWA to DNREC included appreciable concentrations of arsenic and benzene. These data were interpreted by reviewers to indicate that a release of hazardous contaminants had occurred from the landfill. This alleged release resulted in a site Hazard Ranking Score high enough to qualify Pigeon Point Landfill for the National Priorities List. DSWA submitted arguments that these data were invalid and unrepresentative of groundwater conditions at Pigeon Point Landfill.

In order to resolve the controversy over these data, DNREC and EPA agreed that DNREC would resample the monitor wells screened in the Potomac Formation and have them analyzed under currently approved quality control/quality assurance procedures.

IV. FIELD TRIP REPORT

IV. Field Trip Report

A. **Summary of Field Trip** Sampling was performed on September 23 & 24, 1988 at Pigeon Point Landfill under sunny skies with a temperature of 75° F. The DNREC personnel in attendance were Brad L. Smith, John Barndt, Nancy Camp and Deborah Dewsbury. Also present were John Neyman of DSWA and Gino Bianchi Mosquera and Glenn Elliott of Duffield Associates. Jim Rohrbac of DSWA granted permission for site access.

Prior to the site inspection, the EPA approved sampling plan was reviewed and a decontamination area was established.

A total of 10 aqueous samples, including duplicates and blanks, were obtained and analyzed for full organics and inorganics including cyanide (see sample log).

Resampling for inorganic analyses was conducted on September 30, 1988 due to incorrect preservation of samples. Weather conditions were rainy and 75° F.

B. **Site Observations**

o The outer casing of monitoring wells #28, #29, #45, #26R and #27R were observed to be freshly painted.

o At the time of the sampling of monitoring well #26R, there was no lid present.

o It was observed that the water from monitoring well #29 contained PVC shavings.

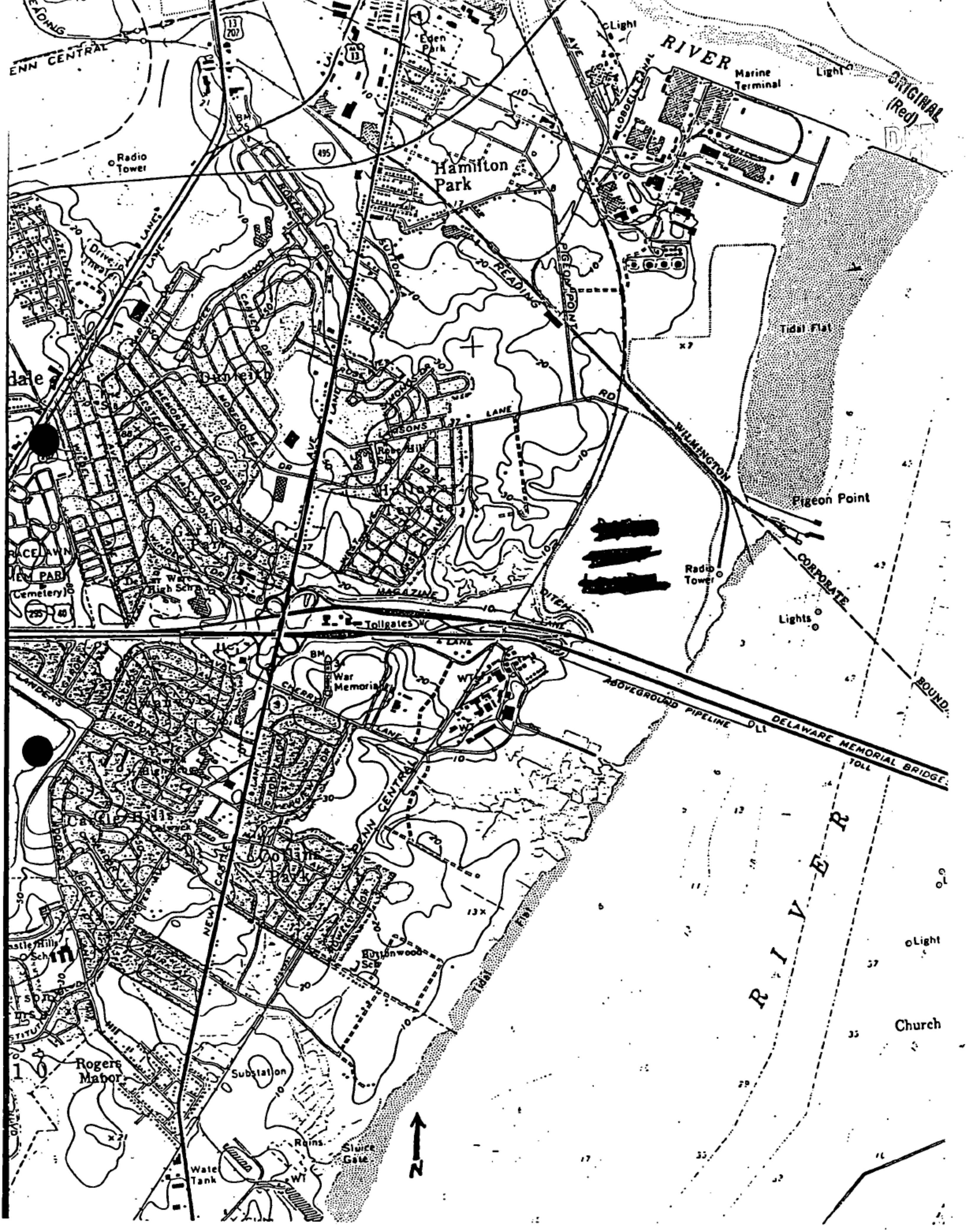
o It should be noted that sandblasting on the Delaware Memorial Bridge was being conducted above monitoring well #28 at the time of sampling.

TDD Number _____
EPA Number _____

SAMPLE LOG

Site Name Pigeon Point Landfill

TRAFFIC REPORTS Organic	Inorganic	High Hazard	SAMPLING LOCATION	PHASE	SAMPLE DESCRIPTION	DATE	TIME	pH	COMMENTS/OBSERVATIONS	LABORATORY
870925-03	—		MW-26R	Aqueous	monitoring well #26R	9/24/87	1330			
870925-04	—		MW-27R		monitoring well #27R	9/24/87	1230			
870925-08	—		MW-31		monitoring well #31	9/24/87	1100		Organics	
870925-09	—		MW-52		Equipment Blank	9/24/87	1100		& Inorganics:	
870925-10	—		MW-45		monitoring well #45	9/23/87	1245			
870925-01	—		MW-25R		monitoring well #25R	9/24/87	1215		EPA Central Reg. Lab	
870925-02	—		MW-28		monitoring well #28	9/23/87	1430		839 Bestgate Rd	
870925-05	—		MW-50		Trip Blank	9/23/87	1530		Annapolis, MD	21401
870925-06	—		MW-51		Duplicate of MW-29	9/23/87	1600			
870925-07	—		MW-29	↓	monitoring well #29	9/23/87	1600			
			Resampling of inorganics							
	871002-05	E	MW-28	Aqueous	monitoring well #28	9/30/87	1130			
	871002-06	U								
	871002-07	E	MW-45		monitoring well #45		1100			
	871002-08	U								
	871002-09	E	MW-29		monitoring well #29		1205		(E) = Filtered	
	871002-10	E								
	871002-11	E	MW-51		Duplicate of MW-29		1208		(U) = Unfiltered	
	871002-12	U								
	871002-13	E	MW-50		Trip Blank		1200			
	871002-14	U								
	871002-15	E	MW-52		Equipment Blank		1235			
	871002-16	U								
	871002-17	E	MW-25R		monitoring well #25R		1435			
	871002-18	U								
	871002-19	E	MW-26R		monitoring well #26R		1400			
	871002-20	U								
	871002-21	E	MW-27R		monitoring well #27R	↓	1340			ORIGINAL (Red)
	871002-22	U								
	871002-23	E	MW-31	↓	monitoring well #31	10/1/87	1000			
	871002-24	U								

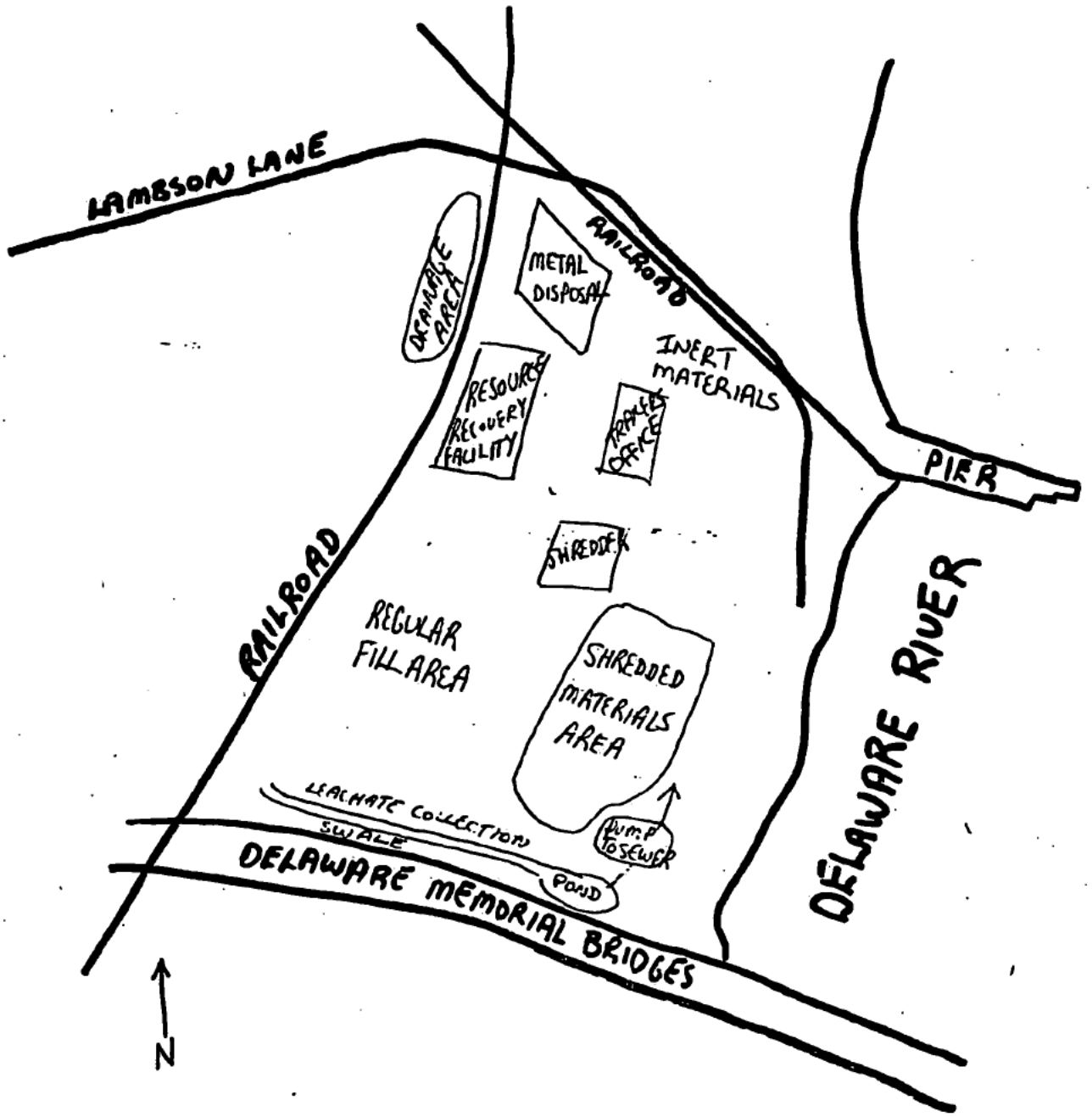


PENN CENTRAL
READING
Light
RIVER
Marine Terminal
Light
ORIGINAL (Red)
Eden Park
Radio Tower
Hamilton Park
Drive-in Theatre
Tidal Flat
Pigeon Point
WILMINGTON
READING
PIGEON POINT
RD
LANE
Rose Hill Sch
[redacted]
Radio Tower
Lights
CORPORATE
BOUND.
Tollgates
MAGAZINE
DITCH
LANE
War Memorial
CHERRY
LANE
ABOVEGROUND PIPELINE
DELAWARE MEMORIAL BRIDGE
TOLL
Delaware High Sch
Cemetery
LANDERS
PENN CENTRAL
NEW CASTLE
Castle Hills
R I V E R
R I V E R
Tidal Flat
Buttonwood Sch
Light
Church
Rogers Manor
Substation
Ruins
Sluice Gate
Water Tank
N

PIGEON POINT LANDFILL

TDD. F3-8010-02

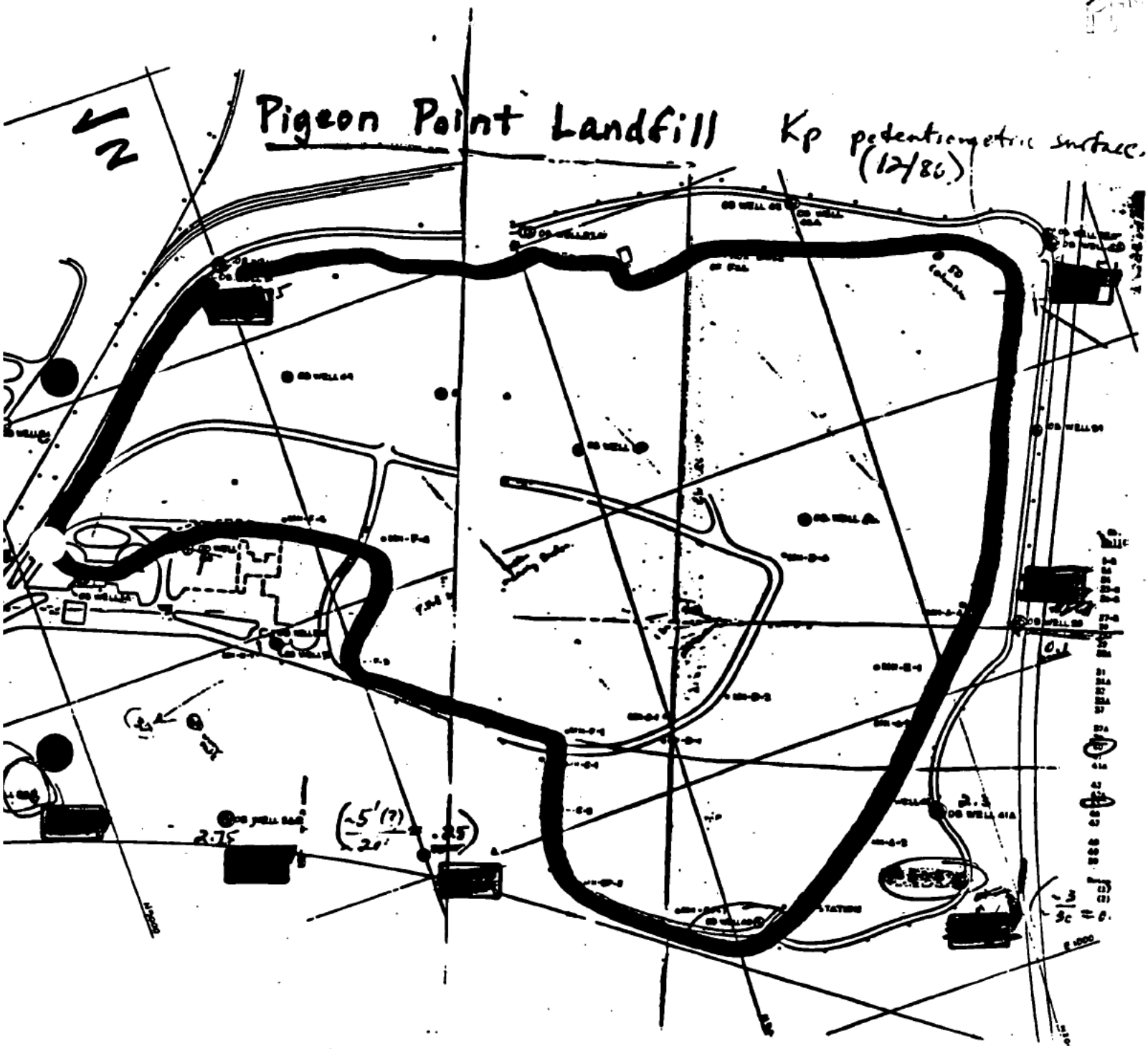
DE-27



ORIGINAL (Red)

Pigeon Point Landfill

Kp potentiometric surface (12/86)



Elev. of well bottoms (ft-rel. MSL)

R	-57.5
[redacted]	-35.6
31	-35.9
41A	-40.4
45	-32.4
[redacted]	-67.9

Color code

- -30 to -40
- -40 to -50
- -50 to -60
- -60 to -70

[redacted]

Well # 45
28
29
26R
31
27R
25R

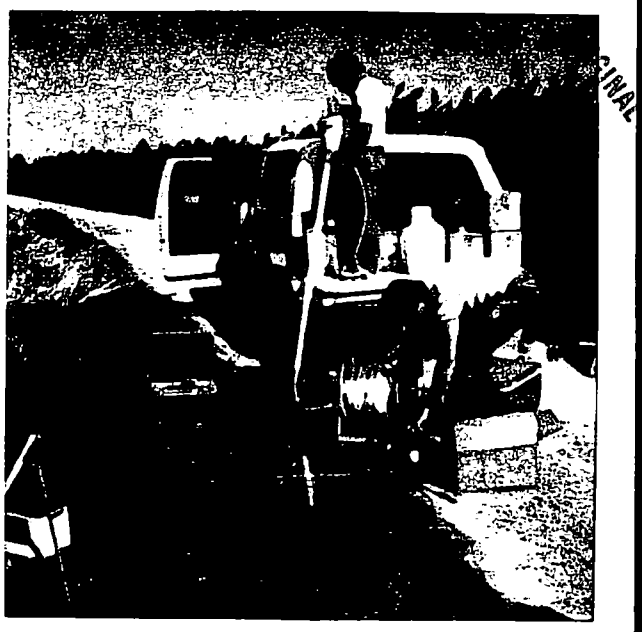


Photo 1 9-24-87
Decontaminating Equipment

Photo 2 9-24-87 Monitoring Well
- 26 R Aqueous Sample

Photo 3 9-24-87 Monitoring Well
- 25 R Aqueous Sample

ORIGINAL (Red)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION
01 STATE: DE | 02 SITE NUMBER: 27

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Pigeon Point Landfill	1 Pigeon Point Road				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG. DIST.**
New Castle	DE	19720	New Castle		

09 COORDINATES LATITUDE 39° 42' 10" | LONGITUDE 075° 32' 00"

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
9 / 23 / 88 (MONTH DAY YEAR)	☒ ACTIVE ☐ INACTIVE	1970 (BEGINNING YEAR) 1985 (ENDING YEAR) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☒ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO
Brad L. Smith	Envir. Scientist	DNREC	(302) 323-4560
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO**
Deborah Dewsbury	Envir. Scientist	DNREC	(302) 323-4560
John Barndt	Hydrogeologist	DNREC	(302) 736-3823
Nancy Camp	Envir. Scientist	DNREC	(302) 736-3689
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
John Neyman		DSWA	( )
Not responsive based on revised scope	Envir. Sci.	Duffield Assoc.	(302) 239-6634
Not responsive based on revised scope		Duffield Assoc	(302) 239-6634
Not responsive based on revised scope			( )
Not responsive based on revised scope			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	9:00 a.m.	Sunny, Windy, 75°F

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Brad L. Smith	Delaware DNREC - DAWN	(302) 323-4560

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jamie Hackney	DNREC	DAWN	(302) 323-4560	09 / 29 / 88 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
DE	27

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D OTHER (Specify)
- E SLURRY
- F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS
- CUBIC YARDS: 5 million
- NO. OF DRUMS

03 WASTE CHARACTERISTICS (Check all that apply)

- A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- X M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES	N/A		
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	Vinyl Chloride		unknown	12.7	ug/l
	Aluminum		unknown	24,900	ug/l
	Barium		unknown	238	ug/l
	Chromium		unknown	97	ug/l
	Copper		unknown	164	ug/l
	Iron		unknown	125,000	ug/l
	Manganese		unknown	28,600	ug/l
	Zinc		unknown	331	ug/l
	Vanadium		unknown	216	ug/l
	Lead		unknown	5	ug/l
	Potassium		unknown	9.8	ug/l
	Sodium		unknown	458	ug/l
	Calcium		unknown	107	ug/l
	Magnesium		unknown	75	ug/l

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	Cobalt	7440-48-4	FDS		
FDS	Nickel	7440-02-0	FDS		
FDS	Cadmium	7440-43-9	FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Delaware DNREC Site Inspection, September 23-24, 1988.

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE: DE	02 SITE NUMBER: 27

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 150,000 — 04 NARRATIVE DESCRIPTION

Potential groundwater contamination from landfill leachate.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

N/A

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

N/A

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

N/A

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

N/A

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION

N/A

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 150,000 — 04 NARRATIVE DESCRIPTION

Potential contamination of Artesian municipal well.

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

N/A

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 150,000 — 04 NARRATIVE DESCRIPTION

Potential contamination of Artesian municipal well.

POTENTIAL

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: DE | 02 SITE NUMBER: 27

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

N/A

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

N/A

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☐ O CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

01 ☐ P ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

N/A

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

N/A

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Brad L. Smith - DE DNREC
Site Inspection - September 23 - 24, 1988

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION
01 STATE: DE
02 SITE NUMBER: 27

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☒ G. STATE (Specify) Solid Waste	SW-75/01	Sept.10,	1974	
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☒ F. LANDFILL	5 million	cu. yds
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)
- ☐ A. INCINERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☒ H. OTHER (Specify) Methane extraction

05 OTHER
- ☒ A. BUILDINGS ON SITE: Pump House

06 AREA OF SITE: 187 total (Acres) 136 acres Landfill

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)
☐ A. ADEQUATE, SECURE ☒ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Leachate collection system, final cover.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☒ NO
02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sampling reports)

DE DNREC Preliminary Assessment - March 1984
DE DNREC Files

ORIGINAL (Red)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
DE	27

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☒ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☑ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☒ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
270 (ft)	15 (ft)	N/A	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE		
		SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
7.29 (in)	2.75 (in)	< 5 %	Radial	0-2 %

09 FLOOD POTENTIAL

SITE IS IN unknown YEAR FLOODPLAIN

10

☒ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. < 100 ft (mi)	B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

N/A (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS	
		PRIME AG LAND	AG LAND
A. < 100 ft (mi)	B. 0.5 (mi)	C. unknown (mi)	D. unknown (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is a 10-15 ft mound.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling results)

Brad L. Smith - DE DNREC
Site Inspection - September 23-24, 1988

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: DE | 02 SITE NUMBER: 27

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)

	SURFACE	WELL
COMMUNITY	A. ☐	B. ☒
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☒
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE
A. < 1 (mi)
B. ____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)
☐ A. ONLY SOURCE FOR DRINKING ☒ B. DRINKING (Other source(s) available) COMMERCIAL, INDUSTRIAL, IRRIGATION (Other water source(s) available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other source(s) available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER: 150,000
03 DISTANCE TO NEAREST DRINKING WATER WELL: < 1 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
20 (ft)	South Eastward	____ (ft)	Unknown (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including acreage, depth, and location relative to population and buildings)

Several public and industrial water supply wells are located within a mile of Pigion Point Landfill.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS	☒ YES ☐ NO	COMMENTS: Site is adjacent to the Delaware Rive

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)
☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☒ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Delaware River	☐	< 1 (mi)
Magazine Ditch	☐	< 1 (mi)
	☐	____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. < 1000 NO OF PERSONS	B. 8,000 NO OF PERSONS	C. 25,000 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION: < 3 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: unknown

04 DISTANCE TO NEAREST OFF-SITE BUILDING: < 1000 ft (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site (e.g., rural, village, densely populated urban area))

Densely populated urban area mixed with an industrial community.

PFE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
DE	2 ORIGINAL (Red)

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	8	US EPA Lab - Region III	March 1988
SURFACE WATER		Central Regional Lab	
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER	2	Quality Control Samples	March 1988

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
HNU	no readings above background detected
Explosimeter	no readings above background detected

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF Delaware DNREC
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS In report and Delaware DNREC

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

No other data were collected.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Brad L. Smith - DE DNREC
Site Inspection - September 23-24, 1988

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
DE	27

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	08 NAME (PARENT COMPANY, if applicable)	09 D+B NUMBER
City of Wilmington		N/A	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**10 STREET ADDRESS (P.O. Box, RFD #, etc.)**	**11 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**12 CITY / 13 STATE / 14 ZIP CODE**	
Wilmington / DE / 19710			
01 NAME	**02 D+B NUMBER**	**08 NAME**	**09 D+B NUMBER**
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**10 STREET ADDRESS (P.O. Box, RFD #, etc.)**	**11 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**12 CITY / 13 STATE / 14 ZIP CODE**	
01 NAME	**02 D+B NUMBER**	**08 NAME**	**09 D+B NUMBER**
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**10 STREET ADDRESS (P.O. Box, RFD #, etc.)**	**11 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**12 CITY / 13 STATE / 14 ZIP CODE**	
01 NAME	**02 D+B NUMBER**	**08 NAME**	**09 D+B NUMBER**
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**10 STREET ADDRESS (P.O. Box, RFD #, etc.)**	**11 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**12 CITY / 13 STATE / 14 ZIP CODE**	

III. PREVIOUS OWNER(S) (List most recent first) / IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
N/A		N/A	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**03 STREET ADDRESS (P.O. Box, RFD #, etc.)**	**04 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**05 CITY / 06 STATE / 07 ZIP CODE**	
01 NAME	**02 D+B NUMBER**	**01 NAME**	**02 D+B NUMBER**
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**03 STREET ADDRESS (P.O. Box, RFD #, etc.)**	**04 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**05 CITY / 06 STATE / 07 ZIP CODE**	
01 NAME	**02 D+B NUMBER**	**01 NAME**	**02 D+B NUMBER**
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	**04 SIC CODE**	**03 STREET ADDRESS (P.O. Box, RFD #, etc.)**	**04 SIC CODE**
05 CITY / 06 STATE / 07 ZIP CODE		**05 CITY / 06 STATE / 07 ZIP CODE**	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Site Inspection - September 23 - 24, 1988

ORIGINAL (Red) DRAFT

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION
01 STATE: DE | 02 SITE NUMBER: 27

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
Delaware Solid Waste Authority	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
Pigeon Point Road	

05 CITY	06 STATE	07 ZIP CODE
New Castle	DE	19720

08 YEARS OF OPERATION	09 NAME OF OWNER

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
N/A	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER
N/A	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling results, reports)

Site Inspection - September 23 - 24, 1988

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
DE	27

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
N/A	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
unknown			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
unknown			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sampling event reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: DE | 02 SITE NUMBER: 27

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ D. SPILLED MATERIAL REMOVED 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ F. WASTE REPACKAGED 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☒ H. ON SITE BURIAL 04 DESCRIPTION:	02 DATE: 1970-1985	03 AGENCY: DSWA
01 ☐ I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☒ K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION:	02 DATE: 1985	03 AGENCY: DSWA
01 ☐ L. ENCAPSULATION 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☐ N. CUTOFF WALLS 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:
01 ☒ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 04 DESCRIPTION: Final Cover	02 DATE: 1985	03 AGENCY: DSWA
01 ☒ P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION: Leachate Collection System	02 DATE: 1974	03 AGENCY: DSWA
01 ☐ Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION: N/A	02 DATE:	03 AGENCY:

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
DE	27

II. PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ S. CAPPING/COVERING — 02 DATE 1985 — 03 AGENCY DSWA
04 DESCRIPTION
Final Cover

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☒ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Lined

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
N/A

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

N/A

III. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Brad L. Smith - DE DNREC

Site Inspection - September 23 - 24, 1988

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE: DE	02 SITE NUMBER: 27

II. ENFORCEMENT INFORMATION N/A

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

N/A

III. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

V. REFERENCES

REFERENCES CITED

Apgar, M.A. (1979) "Concern in Delaware Over Salinity in the Delaware Estuary and its Potential Impact on the Quality of Groundwater in the Potomac Aquifer," Delaware DNREC Staff Paper, 7p.

Apgar, M.A. and Bijay Panigrahi (1982)"Estimated Impacts of Brackish Water from the Delaware Estuary on the Quality of Groundwater and Groundwater-Derived Water Supplies in the Potomac Aquifer in New Castle County, Delaware," Delaware DNREC Staff Paper, 22p.

Martin, M.M. and J.M. Denver (1982)"Hydrologic Data for the Potomac formation in New Castle County, Delaware," U.S. Geological Survey Water-Resources Investigations Open-File Report 81-916, 148p.

Martin, M.M. (1984)"Simulated Groundwater Flow in the Potomac Aquifers, New Castle County, Delaware," U.S. Geological Survey Water Resources Investigations Report 84-4007, 85p.

Phillips, S.W. (1987) "Hydrogeology, Degradation of Groundwater Quality, and Simulation of Infiltration from the Delaware River in to the Potomac Aquifers, Northern Delaware," U.S. Geological survey Water-Resources Investigations Report 87-4185, 86p.

Edward H. Richardson Associates, Inc. (1973) "Preliminary Engineering Design Report: Phase II Pigeon Point Landfill," prepared for Department of Public Works, New Castle county, Delaware.

VI. LABORATORY DATA

DD Number _____

PA Number DE-27

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name Pigeon Pt

Date of Sample _____

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: Arsenic	Antimony	Selenium	Thallium	Mercury	Tin	Cadmium	Lead	Ammonia	Potassium	Cyanide	Sulfide	Sodium	Calcium	Magnesium	Remarks
	MW28-F	aq.	ug/L									5.7			441	67	62		
	MW28-UF											5.6			458	64	61		
	MW45-F														14	12	3.8		
	MW45-UF														14	11	5.0		
	MW29-F											5.7			183	23	33		
	MW29-UF			33*							111*	8.1			179	20	38		
	MW51-F											5.5			183	19	25		
	MW51-UF			33*							135*	10			184	20	39		
	MW50-F																		
	MW50-UF																		
	MW52-F																		
	MW52-UF																		
	MW25R-F											9.8			73	65	45		
	MW25R-UF										10*	9.6			73	64	45		

* all values averaged of range

ORIGINAL

DD Number

EPA Number DE-27

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name Pigeon Pt

Date of Sample

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: Arsenic	Antimony	Selenium	Thallium	Mercury	Tin	Cadmium	Lead	Ammonia Potassium	Cyanide	Sulfide Sodium	Calcium	Magnesium	Remarks
	MW26R-F	gw	ug/l									9.8*		276*	118*	89*	
	MW26R-UF										12*	8.7		246	107	71	
	MW27R-F											7.8		250	77	75	
	MW27R-UF										7.0*	8.1		263	84	75	
	MW31-F										8.0			43*	33*	13*	
	MW31-UF									5	304*	8.1		46	40	15	

* All values averaged of [redacted] range

TDD Number ORIGINAL (Red)
EPA Number DE 27

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☐ Organic ☒ Inorganic

Site Name Pigeon Pt F.U.
Date of Sample

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: Aluminum	Chromium	Barium	Beryllium	Cobalt	Copper	Iron	Nickel	Manganese	Zinc	Boron	Vanadium	Silver	Remarks
	MW28-F	aq	ug/L					203*				9480*	150*				
	MW28-UF			439				186		1,150		9070	175				
	MW45-F									5880		92					
	MW45-UF			4,390						6360		86					
	MW29-F									68,300*		1400					
	MW29-UF			23,050	48*	33			139*	114,000		1,660*	206*		84*		
	MW51-F									67,100		1420					
	MW51-UF			24,900					164	125,000	46	1700	244	91			
	MW50-F																
	MW50-UF																
	MW52-F																
	MW52-UF																
	MW25RF											28,600	82				
	MW25RUF									379		27,200	63				

* Average of range

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

TDD Number: ORIGINAL (Red)
EPA Number: DE 27

☐ Organic ☒ Inorganic

Site Name: Pigeon Pt
Date of Sample:

Compounds Detected

Sample Number	Sample Description and Location	Phase	Units	Aluminum	Chromium	Barium	Beryllium	Cobalt	Copper	Iron	Nickel	Manganese	Zinc	Boron	Vanadium	Silver	Remarks
	MW26R-F	aq	ug/l									27000*					
	MW26R-UF									364		23,000	54				
	MW27R-F							86		935		21,100	45				
	MW27R-UF							95		4,830		23,000	86				
	MW31-F					238				755		564	331				
	MW31-UF			23550	97	369*			129	99,100*		915*	436*		216		

* All values averaged [illegible] range

TDD Number ORIGINAL (R03)
EPA Number SE27

SAMPLE DATA SUMMARY
TARGET COMPOUNDS

☒ Organic ☐ Inorganic

Site Name Pigeon Point F.U.
Date of Sample

Sample Number	Sample Description and Location	Phase	Units	Compounds Detected: Tetrahydro-2,5 Dimethyl Furan	M-Xylene	2,5-Dimethyl Thiophene	Trimethyl Hydrazine	2-Butene Esomer	Benzene	Vinyl Chloride	Trichloroethylene	Ethyl Benzene	Diethylphthalate	D-n-Octylphthalate			Remarks
	MW25R	Aq	ug/l														
	mw 28			1.0J	0.2J	3.4J											
	mw 26R						0.8J						0.2J	1.8J			
	mw 27R												0.7J				
	mw 50							0.8J									
	mw 51								0.2J				0.4J				
	mw 29				0.1J				0.2J								
	mw 31									12.7	0.2J	0.2J	0.5J				
	mw 52				0.1J												
	mw 45												0.5J				

J = estimated quantity

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

ORIGINAL (Red)

DATE : October 27, 1987

SUBJECT: Analytical Reports for Pigeon Point Landfill

FROM : James Barron (3ES21)
Acting Chief, Annapolis Laboratory

TO : Joel Karmazyn (3HW34)

Attached are analytical reports for Pigeon Point Landfill. These reports are for the samples which we received at CRL on September 25, 1987. You may give me a call if you have any questions regarding these samples.

JB:jr

Attachments
a/s

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

DATE : October 26, 1987

SUBJECT: PCB/Pesticide Analysis of Pigeon Point Landfill
Superfund-Remedial, (10/1/87 - 10//15-/87), 870925-01-10

FROM : George E. Bagley
Chemist

TO : Jim Barron
Acting Chief, Annapolis Laboratory

THRU: John Austin
Team Leader, Organic Analysis Section

The subject water samples were extracted and run by the CLP procedure for PCB's and Pesticides. No interferences were noted at the required detection limits. All samples were run in duplicates free of cleanup. Detection limits attached.

Results are shown below:

Sample Decription and Results:

Lab No.	Description	PCB's/Pesticides
870925-01	Pigeon Point Landfill, MW25R, STA MW25R	None Detected
870925-02	Pigeon Point Landfill, MW28, STA MW28	None Detected
870925-03	Pigeon Point Landfill, MW26R, STA MW26R	None Detected
870925-04	Pigeon Point Landfill, MW27R, STA MW27R	None Detected
870925-05	Pigeon Point Landfill, MW50, STA MW50	None Detected
870925-06	Pigeon Point Landfill, MW51, STA MW51	None Detected
870925-07	Pigeon Point Landfill, MW29, STA MW29	None Detected
870925-08	Pigeon Point Landfill, MW31, STA MW31	None Detected
870925-09	Pigeon Point Landfill, MW52, STA MW52	None Detected
870925-10	Pigeon Point Landfill, MW45, STA MW45	None Detected

GEB:nt

cc: Peggy Zawodny
QCO

ORIGINAL (Red)

Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)*

	Pesticides/PCBs	CAS Number	Quantitation Limits** Water ug/L	Low Soil/Sediment[c] ug/Kg
100.	alpha-BHC	319-84-6	0.05	8.0
101.	beta-BHC	319-85-7	0.05	8.0
102.	delta-BHC	319-86-8	0.05	8.0
103.	gamma-BHC (Lindane)	58-89-9	0.05	8.0
104.	Heptachlor	76-44-8	0.05	8.0
105.	Aldrin	309-00-2	0.05	8.0
106.	Heptachlor epoxide	1024-57-3	0.05	8.0
107.	Endosulfan I	959-98-8	0.05	8.0
108.	Dieldrin	60-57-1	0.10	16.0
109.	4,4'-DDE	72-55-9	0.10	16.0
110.	Endrin	72-20-8	0.10	16.0
111.	Endosulfan II	33213-65-9	0.10	16.0
112.	4,4'-DDD	72-54-8	0.10	16.0
113.	Endosulfan sulfate	1031-07-8	0.10	16.0
114.	4,4'-DDT	50-29-3	0.10	16.0
115.	Methoxychlor	72-43-5	0.5	80.0
116.	Endrin ketone	53494-70-5	0.10	16.0
117.	alpha-Chlordane	5103-71-9	0.05	80.0
118.	gamma-Chlordane	5103-74-2	0.05	80.0
119.	Toxaphene	8001-35-2	1.0	160.0
120.	Aroclor-1016	12674-11-2	0.5	80.0
121.	Aroclor-1221	11104-28-2	0.5	80.0
122.	Aroclor-1232	11141-16-5	0.5	80.0
123.	Aroclor-1242	53469-21-9	0.5	80.0
124.	Aroclor-1248	12672-29-6	0.5	80.0
125.	Aroclor-1254	11097-69-1	1.0	160.0
126.	Aroclor-1260	11096-82-5	1.0	160.0

[c]Medium Soil/Sediment Contract Required Quantitation Limits (CRQL) for Pesticide/PCB TCL compounds are 15 times the individual Low Soil/Sediment CRQL.

*Specific quantitation limits are highly matrix dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

**Quantitation limits listed for soil/sediment are based on wet weight. The quantitation Limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

DATE : October 1, 1987

SUBJECT: Cyanide Determinations of Pigeon Point Landfill
Superfund Remedial, (9/28/87 - 10/1/87), 870925-01-10

FROM : Norman Fritsche
Environmental Scientist

TO : Jim Barron
Acting Chief, Annapolis Laboratory

Received 10 samples from Pigeon Point Landfill.

Sample Description and Results:

Lab No.	Description	Cyanide mg/L
870925-01	Pigeon Point Landfill MW25R, STA MW25R	<.020
870925-02	Pigeon Point Landfill MW28, STA MW28	<.020
870925-03	Pigeon Point Landfill MW26R, STA MW 26R	<.020
870925-04	Pigeon Point Landfill MW27R, STA MW 27R	<.020
870925-05	Pigeon Point Landfill MW50, STA MW50	<.020
870925-06	Pigeon Point Landfill MW51, STA MW51	<.020
870925-07	Pigeon Point Landfill MW29, STA MW29	<.020**
870925-08	Pigeon Point Landfill MW31, STA MW31	<.020*(106%)
870925-09	Pigeon Point Landfill MW52, STA MW52	<.020
870925-10	Pigeon Point Landfill MW45, STA MW45	<.020

*Analyzed in duplicates, both values below detection limits.
**Sample improperly preserved.

NF:nt

cc: Peggy Zawodny
QCO

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

ORIGINAL (Red)

DATE : November 6, 1987

SUBJECT: Analytical Reports for Pigeon Point Landfill

FROM : James Barron (3ES21)
Acting Chief, Annapolis Laboratory

TO : Joel Karmazyn (3HW34)

Attached are the analytical reports for Pigeon Point Landfill. These reports are for the samples which were received at CRL on October 2, 1987. You may give me a call if you have any questions regarding these samples.

JB:jr

Attachments
a/s

ORIGINALS (Red)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

DATE : November 6, 1987

SUBJECT: Metals Determinations of Pigeon Point Landfill
Superfund-Remedial (TFA03N9ZZ) (10/5/87 - 10/28/87), 871002-05-24

FROM : Bernard A. Sammons (BAS) Chemist; Charles A. Weisberg (CAW) Chemist; Elmer H. Griffin (EHG) Environmental Scientist

TO : James Barron
Acting Chief, Annapolis Laboratory

THRU: Patricia F. Sosinski (PFS)
Team Leader, Metals Analysis Section

Samples 871002-05-24 were analyzed by furnace atomic absorption spectroscopy and inductively coupled plasma optical emission spectrometry. The results are presented in the attached table.

In those instances when filtered exceeds total, the difference is within the precision of the method.

Additional quality control data are available upon request.

Sample Description:

Lab No.	Description
871002-05	Pigeon Point Landfill, Filtered, STA MW28
871002-06	Pigeon Point Landfill, Unfiltered, STA MW28
871002-07	Pigeon Point Landfill, Filtered, STA MW45
871002-08	Pigeon Point Landfill, Unfiltered, STA MW45
871002-09	Pigeon Point Landfill, Filtered, STA MW29
871002-10	Pigeon Point Landfill, Unfiltered, STA MW29
871002-11	Pigeon Point Landfill, Filtered, STA MW51
871002-12	Pigeon Point Landfill, Unfiltered, STA MW51
871002-13	Pigeon Point Landfill, Filtered, STA MW50
871002-14	Pigeon Point Landfill, Unfiltered, STA MW50
871002-15	Pigeon Point Landfill, Filtered, STA MW52
871002-16	Pigeon Point Landfill, Unfiltered, STA MW52
871002-17	Pigeon Point Landfill, Filtered, STA MW25R
871002-18	Pigeon Point Landfill, Unfiltered, STA MW25R
871002-19	Pigeon Point Landfill, Filtered, STA MW26R
871002-20	Pigeon Point Landfill, Unfiltered, STA MW26R
871002-21	Pigeon Point Landfill, Filtered, STA MW27R
871002-22	Pigeon Point Landfill, Unfiltered, STA MW27R
871002-23	Pigeon Point Landfill, Filtered, STA MW31
871002-24	Pigeon Point Landfill, Unfiltered, STA MW31

BAS/CAW/EHG:nt
cc: Peggy Zawodny, DCO

U.S. Environmental Protection Agency, Region III, Central Regional Laboratory

Project Name: Pigeon Point Landfill, Superfund-Remedial (TFA03N9ZZ)

Sample Number:	871002-05 ug/L	871002-06 ug/L	871002-07 ug/L	871002-08 ug/L	871002-09 ug/L	871002-10 ug/L
METALS - HSL						
Antimony	<5*(MSA)	<5*(86%)	<5(105%)	<5(107%)	<5*(MSA)	<5*(MSA)
Aluminum	<200*(107%)	439	<200	4,390	<200*(100%)	23,050
Arsenic	<5*(MSA)	<5*(MSA)	<5(MSA)	<5(MSA)	<5*(MSA)	33±4(MSA)
Barium	<200*(105%)	<200	<200	<200	<200	<200*(107%)
Beryllium	<5*(87%)	<5	<5	<5	<5	<5*(89%)
Cadmium	<5*(95%)	<5	<5	<5	<5	<5*(93%)
Chromium	<10*(90%)	<10	<10	<10	<10	48±0(90%)
Cobalt	203±3(110%)	186	<50	<50	<50	<50*(97%)
Copper	<25*(95%)	<25	<25	<25	<25	139±3(101%)
Iron	<100*(99%)	1,150	5,880	6,360	68,300±800(99%)	114,000
Lead	<5*(107%)	<5*(98%)	<5(91%)	<5(96%)	<5*(114%)	111±0(112%)
Manganese	9,480±170(105%)	9,070	92	86	1,400	1,660±10(104%)
Nickel	<40*(98%)	<40	<40	<40	<40	<40*(98%)
Selenium	<5*(94%)	<5*(90%)	<5(107%)	<5(98%)	<5*(96%)	<5*(101%)
Silver	<10*(91%)	<10	<10	<10	<10	<10*(99%)

MSA = Method of Standard Additions
*Analyzed in duplicate, both values below specified detection limit.
Numbers in parentheses are spike recoveries.

ORIGINAL (Red)

U.S. Environmental Protection Agency, Region III, Central Regional Laboratory

Project Name: Pigeon Point Landfill, Superfund-Remedial (TFA03N9ZZ)

Sample Number:	871002-05	871002-06	871002-07	871002-08	871002-09	871002-10
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
METALS - HSL						
Thallium	<5*(91%)	<5*(MSA)	<5(98%)	<5(100%)	<5*(93%)	<5*(113%)
Vanadium	<50*(83%)	<50	<50	<50	<50	84±3(88%)
Zinc	150±3(108%)	175	<20	<20	<20	206±4(96%)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Calcium	67±1(111%)	64	12	11	23±1(104%)	20
Magnesium	62±0(115%)	61	3.8	5.0	33±0(105%)	38
Potassium	5.7±0(101%)	5.6	<5.0	<5.0	5.7	8.1±0(102%)
Sodium	441±6(94%)	458	14	14	183	179±0(99%)

MSA = Method of Standard Additions
*Analyzed in duplicate, both values below specified detection limit.
Numbers in parentheses are spike recoveries.

ORIGINAL (Red)

U.S. Environmental Protection Agency, Region III, Central Regional Laboratory

Project Name: Pigeon Point Landfill, Superfund-Remedial (TFA03N9ZZ)

Sample Number:	871002-11 ug/L	871002-12 ug/L	871002-13 ug/L	871002-14 ug/L	871002-15 ug/L	871002-16 ug/L
METALS - HSL						
Antimony	<5(MSA)	<5*(MSA)	<5	<5	<5	<5
Aluminum	<200	24,900	<200	<200	<200	<200
Arsenic	<5(MSA)	33±4(MSA)	<5	<5	<5	<5
Barium	<200	<200	<200	<200	<200	<200
Beryllium	<5	<5	<5	<5	<5	<5
Cadmium	<5	<5	<5	<5	<5	<5
Chromium	<10	54	<10	<10	<10	<10
Cobalt	<50	<50	<50	<50	<50	<50
Copper	<25	164	<25	<25	<25	<25
Iron	67,100	125,000	<100	<100	<100	<100
Lead	<5(MSA)	135±1(93%)	<5	<5	<5	<5
Manganese	1,420	1,700	<15	<15	<15	<15
Nickel	<40	46	<40	<40	<40	<40
Selenium	<5(90%)	<5*(100%)	<5	<5	<5	<5
Silver	<10	<10	<10	<10	<10	<10

MSA = Method of Standard Additions
*Analyzed in duplicate, both values below specified detection limit.
Numbers in parentheses are spike recoveries.

ORIGINAL (Red)

Project Name: Pigeon Point Landfill, Superfund-Remedial (TFA03N9ZZ)

Sample Number:	871002-11	871002-12	871002-13	871002-14	871002-15	871002-16
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
METALS - HSL						
Thallium	<5(98%)	<5*(107%)	<5	<5	<5	<5
Vanadium	<50	91	<50	<50	<50	<50
Zinc	<20	244	<20	<20	<20	<20
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Calcium	19	20	<1.0	<1.0	<1.0	<1.0
Magnesium	25	39	<1.0	<1.0	<1.0	<1.0
Potassium	5.5	10	<5.0	<5.0	<5.0	<5.0
Sodium	183	184	<5.0	<5.0	<5.0	<5.0

MSA = Method of Standard Additions
*Analyzed in duplicate, both values below specified detection limit.
Numbers in parentheses are spike recoveries

Project Name: Pigeon Point Landfill, Superfund-Remedial (TFA03N9ZZ)

Sample Number:	871002-17 ug/L	871002-18 ug/L	871002-19 ug/L	871002-20 ug/L	871002-21 ug/L	871002-22 ug/L
METALS - HSL						
Antimony	<5*(86%)	<5*(86%)	<5(86%)	<5*(86%)	<5(MSA)	<5*(MSA)
Aluminum	<200	<200	<200*(90%)	<200	<200	1,500
Arsenic	<5*(86%)	<5*(MSA)	<5(MSA)	<5*(MSA)	<5(MSA)	<5*(MSA)
Barium	<200	<200	<200*(102%)	<200	<200	<200
Beryllium	<5	<5	<5*(93%)	<5	<5	<5
Cadmium	<5	<5	<5*(102%)	<5	<5	<5
Chromium	<10	<10	<10*(96%)	<10	<10	<10
Cobalt	<50	<50	<50*(108%)	<50	86	95
Copper	<25	<25	<25*(102%)	<25	<25	<25
Iron	<100	379	<100*(97%)	364	935	4,830
Lead	<5*(113%)	10±1(MSA)	<5(100%)	12±0(MSA)	<5(101%)	7±0(MSA)
Manganese	28,600	27,200	27,000±100(112%)	23,000	21,100	23,000
Nickel	<40	<40	<40*(96%)	<40	<40	<40
Selenium	<5*(85%)	<5*(MSA)	<5(88%)	<5*(88%)	<5(92%)	<5*(MSA)
Silver	<10	<10	<10*(95%)	<10	<10	<10

MSA = Method of Standard Additions
*Analyzed in duplicate, both values below specified detection limit.
Numbers in parentheses are spike recoveries.

Project Name: Pigeon Point Landfill, Superfund-Remedial (TFA03N9ZZ)

Sample Number:	871002-17	871002-18	871002-19	871002-20	871002-21	871002-22
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
METALS - HSL						
Thallium	<5*(MSA)	<5*(105%)	<5(95%)	<5*(93%)	<5(95%)	<5*(95%)
Vanadium	<50	<50	<50*(90%)	<50	<50	<50
Zinc	82	63	<20*(110%)	54	45	86
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Calcium	65	64	118±0(87%)	107	77	84
Magnesium	45	45	89±1(100%)	71	75	75
Potassium	9.8	9.6	9.8±0(106%)	8.7	7.8	8.1
Sodium	73	73	276±8(96%)	246	250	263

MSA = Method of Standard Additions
*Analyzed in duplicate, both values below specified detection limit.
Numbers in parentheses are spike recoveries.

ORIGINAL (Red)

U.S. Environmental Protection Agency, Region III, Central Regional Laboratory

Project Name: Pigeon Point Landfill, Superfund-Remedial (TFA03N9ZZ)

ORIGINAL (Red)

Sample Number:	871002-23	871002-24
	ug/L	ug/L
METALS - HSL		
Antimony	<5*(92%)	<5*(MSA)
Aluminum	<200*(95%)	23,550
Arsenic	<5*(MSA)	<5*(MSA)
Barium	238±1(93%)	369
Beryllium	<5*(91%)	<5
Cadmium	<5*(88%)	5
Chromium	<10*(85%)	97
Cobalt	<50*(92%)	<50
Copper	<25*(94%)	129
Iron	755±1(99%)	99,100
Lead	8±0(MSA)	304±0(109%)
Manganese	564±18(91%)	915
Nickel	<40*(94%)	<40
Selenium	<5*(96%)	<5*(107%)
Silver	<10	<10
Thallium	<5*(MSA)	<5*(MSA)
Vanadium	<50*(89%)	216
Zinc	331±3(106%)	436
	mg/L	mg/L
Calcium	33±0(100%)	40
Magnesium	13±0(98%)	15
Potassium	<5.0*(108%)	8.1
Sodium	43±0(102%)	46

MSA = Method of Standard Additions
*Analyzed in duplicate, both values below specified detection limit.
Numbers in parentheses are spike recoveries.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

ORIGINAL (Red)

ORIGINAL (Red)

DATE : October 20, 1987

SUBJECT: Mercury Analysis of Pigeon Point Landfill Samples
Superfund-Remedial (TFA03N9ZZ), (10/5/87 - 10/14/87), 871002-05-24

FROM : Ronald H. Altman RA
Chemist

TO : James Barron
Acting Chief, Annapolis Laboratory

THRU: Patricia F. Sosinski PFS
Team Leader, Metals Analysis Section

Samples 871002-05-24 were analyzed for mercury by automated cold vapor atomic absorption spectroscopy. The results are presented in the table below.

Additional quality control data are available upon request.

Description and Results:

Sample No.	Description	Results Hg ug/L
871002-05	Pigeon Point Landfill, Filtered, STA MW28	<0.2*(116%)
871002-06	Pigeon Point Landfill, Unfiltered, STA MW28	<0.2
871002-07	Pigeon Point Landfill, Filtered, STA MW45	<0.2
871002-08	Pigeon Point Landfill, Unfiltered, STA MW45	<0.2
871002-09	Pigeon Point Landfill, Filtered, STA MW29	0.3
871002-10	Pigeon Point Landfill, Unfiltered, STA MW29	0.4
871002-11	Pigeon Point Landfill, Filtered, STA MW51	<0.2
871002-12	Pigeon Point Landfill, Unfiltered, STA MW51	0.4
871002-13	Pigeon Point Landfill, Filtered, STA MW50	<0.2
871002-14	Pigeon Point Landfill, Unfiltered, STA MW50	<0.2
871002-15	Pigeon Point Landfill, Filtered, STA MW52	<0.2
871002-16	Pigeon Point Landfill, Unfiltered, STA MW52	<0.2
871002-17	Pigeon Point Landfill, Filtered, STA MW25R	<0.2
871002-18	Pigeon Point Landfill, Unfiltered, STA MW25R	<0.2
871002-19	Pigeon Point Landfill, Filtered, STA MW26R	<0.2
871002-20	Pigeon Point Landfill, Unfiltered, STA MW26R	<0.2
871002-21	Pigeon Point Landfill, Filtered, STA MW27R	<0.2
871002-22	Pigeon Point Landfill, Unfiltered, STA MW27R	<0.2
871002-23	Pigeon Point Landfill, Filtered, STA MW31	<0.2
871002-24	Pigeon Point Landfill, Unfiltered, STA MW31	0.5±0 (104%)

*Sample analyzed in duplicates, both values below the analytical detection limit.
Numbers in parentheses are spike recoveries.

RA:nt
cc: Peggy Zawodny, QCO

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

REGION 3
Curtis Bldg., 6th & Walnut Sts.
Philadelphia, Pennsylvania 19106

PROJ. NO. | PROJECT NAME: PPL

SAMPLERS: (Signature) non responsive based on revised scope

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	1000mL poly / Teflon lid	REMARKS
MW28	9/30	11:30		X	Filtered	1	✓	87100205 3-114713 Preserved w/ HNO3 to ph2
MW28	9/30	11:35		X	Unfiltered	1	✓	87100206 3-114714
MW45	9/30	11:00		X	Filtered	1	✓	87100207 3-114715
MW45	9/30	10:45		X	Unfiltered	1	✓	87100208 3-114916
MW29	9/30	1205		X	Filtered	1	✓	87100209 3-114717
MW29	9/30	1205		X	Unfiltered	1	✓	87100210 3-114718
MW51	9/30	1208		X	Filtered	1	✓	87100211 3-114719
MW51	9/30	1208		X	Unfiltered	1	✓	87100212 3-114720
MW50	9/30	1200		X	Filtered	1	✓	87100213 3-114721
MW50	9/30	1200		X	Unfiltered	1	✓	87100214 3-114722
MW52	9/30	1235		X	Filtered	1	✓	87100215 3-114723
MW52	9/30	1235		X	Unfiltered	1	✓	87100216 3-114724
MW25R	9/30	1435		X	Filtered	1	✓	87100217 3-114725
MW25R	9/30	1440		X	Unfiltered	1	✓	87100218 3-114726

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
non responsive based on revised scope	10/1/87 1500				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature]	10-2-87 1101		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-9333

Office of Enforcement

CHAIN OF CUSTODY RECORD

Philadelphia, Pennsylvania 19106

PROJ. NO.	PROJECT NAME
	PPL

SAMPLERS: (Signature) non responsive based on revised scope

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	1000 poly | Teflon Lid						REMARKS
26R	9/30	1400		X	Filtered	1	✓		87100219				3-114727 Preserved w/
26R	9/30	1400		X	Unfiltered	1	✓		87100220				3-114728 HNO_3 to ph2
27R	9/30	1340		X	Filtered	1	✓		87100221				3-114731
27R	9/30	1335		X	Unfiltered	1	✓		87100222				3-114732
MW31	10/1	1000		X	Filtered	1	✓		87100223				3-114729
MW31	10/1	1000		X	Unfiltered	1	✓		87100224				3-114730

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
non responsive based on revised scope	10/1/87 1500				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
			10-2-87 1101		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

ORIGINAL (Red)

3-9334

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

ORIGINAL (Red)

DATE : October 27, 1987

SUBJECT: Analytical Reports for Pigeon Point Landfill

FROM : James Barron (3ES21)
Acting Chief, Annapolis Laboratory

TO : Joel Karmazyn (3HW34)

Attached are analytical reports for Pigeon Point Landfill. These reports are for the samples which we received at CRL on September 25, 1987. You may give me a call if you have any questions regarding these samples.

JB:jr

Attachments
a/s

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

ORIGINAL (Red)

DATE : October 26, 1987

SUBJECT: PCB/Pesticide Analysis of Pigeon Point Landfill
Superfund-Remedial, (10/1/87 - 10//15-/87), 870925-01-10

FROM : George E. Bagley
Chemist

TO : Jim Barron
Acting Chief, Annapolis Laboratory

THRU: John Austin
Team Leader, Organic Analysis Section

The subject water samples were extracted and run by the CLP procedure for PCB's and Pesticides. No interferences were noted at the required detection limits. All samples were run in duplicates free of cleanup. Detection limits attached.

Results are shown below:

Sample Decription and Results:

Lab No.	Description	PCB's/Pesticides
870925-01	Pigeon Point Landfill, MW25R, STA MW25R	None Detected
870925-02	Pigeon Point Landfill, MW28, STA MW28	None Detected
870925-03	Pigeon Point Landfill, MW26R, STA MW26R	None Detected
870925-04	Pigeon Point Landfill, MW27R, STA MW27R	None Detected
870925-05	Pigeon Point Landfill, MW50, STA MW50	None Detected
870925-06	Pigeon Point Landfill, MW51, STA MW51	None Detected
870925-07	Pigeon Point Landfill, MW29, STA MW29	None Detected
870925-08	Pigeon Point Landfill, MW31, STA MW31	None Detected
870925-09	Pigeon Point Landfill, MW52, STA MW52	None Detected
870925-10	Pigeon Point Landfill, MW45, STA MW45	None Detected

GEB:nt

cc: Peggy Zawodny
QCO

ORIGINAL (Red)

Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)*

Pesticides/PCBs	CAS Number	Quantitation Limits** Water ug/L	Low Soil/Sediment[c] ug/Kg
100. alpha-BHC	319-84-6	0.05	8.0
101. beta-BHC	319-85-7	0.05	8.0
102. delta-BHC	319-86-8	0.05	8.0
103. gamma-BHC (Lindane)	58-89-9	0.05	8.0
104. Heptachlor	76-44-8	0.05	8.0
105. Aldrin	309-00-2	0.05	8.0
106. Heptachlor epoxide	1024-57-3	0.05	8.0
107. Endosulfan I	959-98-8	0.05	8.0
108. Dieldrin	60-57-1	0.10	16.0
109. 4,4'-DDE	72-55-9	0.10	16.0
110. Endrin	72-20-8	0.10	16.0
111. Endosulfan II	33213-65-9	0.10	16.0
112. 4,4'-DDD	72-54-8	0.10	16.0
113. Endosulfan sulfate	1031-07-8	0.10	16.0
114. 4,4'-DDT	50-29-3	0.10	16.0
115. Methoxychlor	72-43-5	0.5	80.0
116. Endrin ketone	53494-70-5	0.10	16.0
117. alpha-Chlordane	5103-71-9	0.05	80.0
118. gamma-Chlordane	5103-74-2	0.05	80.0
119. Toxaphene	8001-35-2	1.0	160.0
120. Aroclor-1016	12674-11-2	0.5	80.0
121. Aroclor-1221	11104-28-2	0.5	80.0
122. Aroclor-1232	11141-16-5	0.5	80.0
123. Aroclor-1242	53469-21-9	0.5	80.0
124. Aroclor-1248	12672-29-6	0.5	80.0
125. Aroclor-1254	11097-69-1	1.0	160.0
126. Aroclor-1260	11096-82-5	1.0	160.0

[c]Medium Soil/Sediment Contract Required Quantitation Limits (CRQL) for Pesticide/PCB TCL compounds are 15 times the individual Low Soil/Sediment CRQL.

*Specific quantitation limits are highly matrix dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

**Quantitation limits listed for soil/sediment are based on dry weight. The quantitation Limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

ORIGINAL (Red)

DATE : October 1, 1987

SUBJECT: Cyanide Determinations of Pigeon Point Landfill
Superfund Remedial, (9/28/87 - 10/1/87), 870925-01-10

FROM : Norman Fritsche
Environmental Scientist

TO : Jim Barron
Acting Chief, Annapolis Laboratory

Received 10 samples from Pigeon Point Landfill.

Sample Description and Results:

Lab No.	Description	Cyanide mg/L
870925-01	Pigeon Point Landfill MW25R, STA MW25R	<.020
870925-02	Pigeon Point Landfill MW28, STA MW28	<.020
870925-03	Pigeon Point Landfill MW26R, STA MW 26R	<.020
870925-04	Pigeon Point Landfill MW27R, STA MW 27R	<.020
870925-05	Pigeon Point Landfill MW50, STA MW50	<.020
870925-06	Pigeon Point Landfill MW51, STA MW51	<.020
870925-07	Pigeon Point Landfill MW29, STA MW29	<.020**
870925-08	Pigeon Point Landfill MW31, STA MW31	<.020*(106%)
870925-09	Pigeon Point Landfill MW52, STA MW52	<.020
870925-10	Pigeon Point Landfill MW45, STA MW45	<.020

*Analyzed in duplicates, both values below detection limits.
**Sample improperly preserved.

NF:nt

cc: Peggy Zawodny
QCO

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

ORIGINAL (Red)

DATE : October 9, 1987

SUBJECT: Pigeon Point Landfill; Water Samples for VOC's by GC/MS
Superfund-Remedial TFA03N9ZZ; (9/29/87 - 10/5/87), 870925-01-10

FROM : Rick Dreisch RD
Chemist
Ruth Lopez RL
Environmental Engineer

TO : Daniel K. Donnelly
Chief, Annapolis Laboratory

THRU: John Austin JA
Team Leader, Organic Analysis Section

The above samples were analyzed for the presence of volalite organic compounds amenable to purge and trap and identificable by GC/MS.

Sample Description:

Lab No.	Description
870925-01	Pigeon Point Landfill, MW25R, STA MW25R
870925-02	Pigeon Point Landfill, MW28, STA MW28
870925-03	Pigeon Point Landfill, MW26R, STA MW26R
870925-04	Pigeon Point Landfill, MW27R, STA MW27R
870925-05	Pigeon Point Landfill, MW50, STA MW50
870925-06	Pigeon Point Landfill, MW51, STA MW51
870925-07	Pigeon Point Landfill, MW29, STA MW29
870925-08	Pigeon Point Landfill, MW31, STA MW31
870925-09	Pigeon Point Landfill, MW52, STA MW52
870925-10	Pigeon Point Landfill, MW45, STA MW45

QA Summary:

	Average % Recovery 9/29/87
Bromochloromethane	78 ± 11
1,4-Dichlorobutane	120 ± 12
Para-Bromofluorobenzene	117 ± 14
n =	12

RD/RL:nt

cc: Peggy Zawodny PZ
QCO

VII. APPENDICES

ORIGINAL (Red)

A Preliminary Assessment

of

Pigeon Point Landfill

EPA No. DE-27

Emergency and Remedial Response Information System

Grant No. X-003282-01-0

March, 1984

Presented to: Mr. E. Skernolis, Acting Chief, Site Investigation & Support Section, U.S. EPA, Region III

Prepared by: Delaware Department of Natural Resources and Environmental Control, Solid Waste Branch

non responsive based on revised scope [redacted], ERRIS Investigator

[redacted], ERRIS Coordinator

Table of Contents

ORIGINAL (Red)

I. Introduction

ORIGINAL (Red)

Inquiry Source

Eckhardt List, 1979

Summary

Pigeon Point Landfill, located along the Delaware River just north of the west bound span of the Delaware Memorial Bridge, has been used for the disposal of municipal and industrial waste from 1971 until the present.[1] Between forty and fifty years prior to landfilling, this 187 acre site was used by the Army Corps of Engineers to dispose of dredge spoils from the Christina and Delaware Rivers.[2] Since its opening, all municipal waste from new Castle County have been landfilled at Pigeon Point.* Plans for closure and covering of the landfill will be implemented in early 1985 by the Delaware Solid Waste Authority (DSWA).6 Municipal and industrial sludges were not accepted at Pigeon Point after Nov. 19, 1980. Other industrial wastes disposed of here include: paint pigments and sludges, metal sludges, petroleum refinery wastes, PVC wastes, chemical process wastes, polylene and phenol-resins.[1&4] Control and operation of the landfill was transferred from the county to the DSWA on Jan. 1, 1981.[5] Prior to the transfer the county had installed leachate collection system for the eastern portion of the landfill; since that time DSWA has completed a leachate collection system for the western portion.[7] Ground water monitoring is conducted through test wells in all the aquifers beneath the landfill.[3,4&5]

Recommendation

Since the Pigeon Point Landfill has an adequate leachate collection and monitoring well system and the DSWA is required to maintain and monitor this facility after its closure, no further action is required under the ERRIS program.

II. Site History

Permits

Pigeon Point operates under a Solid Waste Disposal permit from the Department of Natural Resources and Environmental Control.[5]

Site Owner

The Pigeon Point Landfill was turned over to the Delaware Solid Waste Authority on January 1, 1981. New Castle County owned the land prior to this time.

Area Residents

No area residents were contacted during this preliminary assessment.

Media Coverage

No media coverage was found in the News Journal library concerning the operation of Pigeon Point Landfill.

Enforcement Status

No regulatory action has ever been taken against the DSWA or New Castle County concerning this operation and maintenance of Pigeon Point by the Department of Natural Resources and Environmental Control.

III. Environmental Setting

Surface Water

Pigeon Point Landfill is bordered by both the Christina River on the north and the Delaware River on the south. In the past leachate was allowed to flow directly into the Delaware River from the landfill. This practice ceased when the county constructed the eastern portion of the leachate collection system in 1980.

Groundwater

The Columbia and Potomac formations below the landfill both produce considerable amounts of water. Analysis from the monitoring wells at Pigeon point show that the Columbia aquifer is severely contaminated with metals. The Potomac aquifer is somewhat less contaminated.[3&4] The water table aquifer occurs within the marsh/hyperulic fill material normally within 20 ft. of the surface of the landfill. See Appendix C for more detail of the ground water quality and elevation. The DNREC has monitored the affects of the landfill contaminating the adjacent production wells at ICI, Americas,Inc. No relationship was established.[9]

Geology and Soils

The original surface material at Pigeon Point were recently deposited marsh and overlying silts and sands of the Columbia formation. Beneath the Columbia formation lies the Potomac formation which overlies the Crystaline Bedrock. Dredge spoils from the Delaware River were deposited over the entire site to a depth of 10-20 ft. by the Army Corps of Engineers from 1920 until 1970. The fill material was deposited on top of the dredge spoils (see geologic cross-section in Appendix A) to a maximum depth of 40 ft. The average depth of the fill material is approximately 20 ft.[2]

Land Use

The land adjacent to Pigeon point landfill is used primarily for general industry. There are residents within one mile of the landfill.

Population Distribution

Less than 1,000 people reside within one mile of the Pigeon Point Landfill in addition to several hundred which work at adjacent industrial sites.

Water Supply

Water in the vicinity of the landfill is supplied by Wilmington Suburban and the City of Wilmington. The closest production well is located 1.5 miles to the southwest of Pigeon Point.

Critical Environment

State wetlands are located within 1/2 mile of the Pigeon Point Landfill boundary. There is no evidence that they have been affected by the landfill.

Additional Information

Closure Plans - The Pigeon Point Landfill will be completed and closed by mid-1985. All solid waste will then be disposed at the New Cherry Island landfill. The landfill will be closed section by section as they are filled. This process has already started (see maps). The final cover will consist of a total of two feet of clean fill. This could constitute a variety of combination of material. The most probable will be the following:

first six inches of daily cover, covered with 6 inches of Type G fill (a silt-clay subsoil), followed by a mix of 50 percent Type G and 50 percent humus produced at the recovery plant.

If grass does not take well in the 50-50 mix the following cover will be used:

six inches daily cover, followed by 12 inches of the 50-50 mix with 6 inches of top soil on the surface.[6]

IV. Preliminary Assessment Form

ORIGINAL (Red)

EPA POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION	SITE NUMBER (To be assigned by HQ)
III	DE-27

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Pigeon Point Landfill

B. STREET *(or other identifier)*: Pigeon Point Road

C. CITY: New Castle

D. STATE: DE

E. ZIP CODE: 19720

F. COUNTY NAME: New Castle

G. OWNER/OPERATOR *(if known)*

1. NAME: Delaware Solid Waste Authority - DSWA
2. TELEPHONE NUMBER: 302-736-5361

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☒ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☐ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION

state owned & operated municiple landfill for New Castle County

J. HOW IDENTIFIED *(i.e., citizen's complaints, OSHA citations, etc.)*: Eckhardt List - DNREC - Solid Waste Branch

K. DATE IDENTIFIED *(mo., day, & yr.)*: 1979

L. PRINCIPAL STATE CONTACT

1. NAME: Robert Pickert, DNREC - Solid Waste Branch
2. TELEPHONE NUMBER: 302-736-4781

II. PRELIMINARY ASSESSMENT *(complete this section last)*

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☐ 3. LOW ☒ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION

☒ 1. NO ACTION NEEDED *(no hazard)*

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR: _____
b. WILL BE PERFORMED BY: _____

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR: _____
b. WILL BE PERFORMED BY: _____

☐ 4. SITE INSPECTION NEEDED *(low priority)*

C. PREPARER INFORMATION

1. NAME: Andrew Bullen, DNREC
2. TELEPHONE NUMBER: 302-736-4781
3. DATE *(mo., day, & yr.)*: 2/21/84

III. SITE INFORMATION

A. SITE STATUS

☒ 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if intermittently.)* Until 1985

☐ 2. INACTIVE *(Those sites which no longer receive wastes.)*

☐ 3. OTHER *(specify)*: _____ *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

☒ 1. NO ☐ 2. YES *(specify generator's four-digit SIC Code)*: _____

C. AREA OF SITE *(in acres)*: 187 acres - 136 used

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES

1. LATITUDE *(deg.-min.-sec.)*: 39° 42' 10"
2. LONGITUDE *(deg.-min.-sec.)*: 75° 32' 00"

E. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO ☒ 2. YES *(specify)*: _____

Continued From Front

ORIGINAL (Red)

V. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Accepts domestic garbage and non-hazardous industrial waste for all of New Castle County. Has a complete leachate collection and monitoring well system.

V. WASTE RELATED INFORMATION

A. WASTE TYPE

☐ 1. UNKNOWN ☐ 2. LIQUID ☒ 3. SOLID ☒ 4. SLUDGE ☐ 5. GAS

B. WASTE CHARACTERISTICS

☐ 1. UNKNOWN ☐ 2. CORROSIVE ☐ 3. IGNITABLE ☐ 4. RADIOACTIVE ☐ 5. HIGHLY VOLATILE
☐ 6. TOXIC ☐ 7. REACTIVE ☐ 8. INERT ☐ 9. FLAMMABLE

☒ 10. OTHER (specify): Toxic waste has been dumped in the past

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
X (1) PAINT, PIGMENTS	(1) OILY WASTES	(1) HALOGENATED SOLVENTS	(1) ACIDS	(1) FLYASH	(1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	XX (2) HOSPITAL
(3) POTW		X (3) OTHER (specify): midnight dumping of toluene	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	X (4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	X (6) OTHER (specify): domestic waste 1500/tons/day 1971-1985	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify)		

Continue On Page 3

Continued From Page 2

V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard).

Industrial sludges, (paint, metals), toluene (midnight dumping)

ORIGINAL (Red)

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

This landfill was poorly operated during the early 1970's, presently it is very well managed with a complete waste recovery system. Will be closed in early 1985.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo., day, yr.)	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH	X			Potential existed in the past
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			Due mostly to dredge spoils
8. CONTAMINATION OF SURFACE WATER		X		Exist in the past. Leachate discharged to the Delaware River
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR		X		Past fires at the site
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION		X		Fires during union strikes in the past.
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS		X		Some erosion noted on dikes surrounding landfill
19. INADEQUATE SECURITY		X		Past incidents
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING		X		Past incidents
22. OTHER (specify):				

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

ORIGINAL (Red)

- [ ] 1. NPDES PERMIT
- [ ] 2. SPCC PLAN
- [X] 3. STATE PERMIT (specify): solid waste permit
- [ ] 4. AIR PERMITS
- [ ] 5. LOCAL PERMIT
- [ ] 6. RCRA TRANSPORTER
- [ ] 7. RCRA STORER
- [ ] 8. RCRA TREATER
- [ ] 9. RCRA DISPOSER
- [ ] 10. OTHER (specify):

B. IN COMPLIANCE?

- [X] 1. YES
- [ ] 2. NO
- [ ] 3. UNKNOWN

4. WITH RESPECT TO (list regulation name & number):

VIII. PAST REGULATORY ACTIONS

- [X] A. NONE
- [ ] B. YES (summarize below)

IX. INSPECTION ACTIVITY (past or on-going)

- [ ] A. NONE
- [ ] B. YES (complete items 1,2,3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
site inspection	1980	EPA	

X. REMEDIAL ACTIVITY (past or on-going)

- [ ] A. NONE
- [ ] B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment (*Section II*) information on the first page of this form.

V. Field Trip Summary Report

ORIGINAL (Red)

FIELD TRIP SUMMARY REPORT

This summary should be prepared in conjunction with the Preliminary Assessment Form, (EPA Form T2070-2), so that a proper site rating can be assigned.

Name of Site Pigeon Point Landfill

EPA Case Number DE-27

TDD Number _____

I. If site is active, has owner/operator notified EPA in accordance with Section 3010 of RCRA. Yes ___ No X

If Yes: a) Note EPA I.D. No. _____
b) Is the site a generator, storer, treater or disposer of hazardous waste? (CIRCLE ONE).

II. If the answers submitted in Part VI (Hazard Description) of EPA Form T2070-2 or observations warrant a more thorough site investigation/sampling, please attach a sketch map showing those areas of concern. (i.e.: lagoons, leachate seeps, drum storage, monitoring wells, etc.).

III. Please list site contacts and accompanying inspectors; include name, title and phone numbers: _____

Eric Schauffer, Landfill Manager, DSWA

Andrew Bullen, Solid Waste Branch, DNREC

IV. Site observations: (attach a topo map).

A. Population within 1000 ft. of the site is (CIRCLE ONE)

(1) 0-10 people
2. 10-100 people
3. greater than 100 people

B. List surrounding land use: (wood lot, agricultural, playground, industrial, etc.).

North: sludge druing lagoons from WWTP

South: ICI Americas, marsh

East: Delaware River

West: Penn Central Railroad, Holloway Terrace (residential)

ORIGINAL (Red)

C. Water supply for area. (CIRCLE ONE)

1. Surface intakes (locate on attached map)
2. Municipal wells (locate on map)
3. Domestic wells:
   a. Approximate number within 1/4 mile. None
   b. Locate a minimum of 3 wells on attached map and list below:

Property owner	_____	_____	_____
Address	_____	_____	_____
Phone No.	_____	_____	_____
Well records	YES___ NO___	YES___ NO___	YES___ NO___
Odor Problems	YES___ NO___	YES___ NO___	YES___ NO___
Taste Problems	YES___ NO___	YES___ NO___	YES___ NO___

   c. If odor or taste problems are reported please elaborate: _____

D. Are surface or subsurface, (leachate), drainage areas from site apparent? YES___ NO X. If yes:

1. Were unusual odors or stains noted? YES___ NO X
2. Was stressed vegetation noted? YES___ NO X

E. Are streams or receiving waters adjacent to site? YES X NO___
If yes, list observations: (i.e. - change in benthic community, change in plant density/diversity, change in color, siltation, etc.). Pigeon Point is located along the Delaware River. No leachate has entered the Delaware River since the county completed the eastern leachate collection system in late 1979.

F. Site topography: (i.e. - plateau, strip mine ravines, etc.). A built-up plateau of dredge spoils and waste material along the Delaware River

G. Other observations: (i.e. - erosion, located in flood plain, etc.). Some erosion noted on the east side of landfill where cover was not vegetated.

ORIGINAL (Red)

FIELD TRIP SUMMARY REPORT TDD Number _____

V. Were photographs taken? YES X NO ___
If yes: Who has custody of photographs?

Name: _____

Agency: Solid Waste Branch - DNREC

Phone No.: 302-736-4781

VI. Is a hydrogeological survey for this site attached? YES ___ NO X
If no, Section III D of EPA Form T2070-2 must be completed.

VII. Please attach pertinent copies of reports or data reviewed by inspector: (i.e. - State monitoring data, consultant reports, etc.).

VIII. Name of Inspector: Andrew Bullen

Agency: Solid Waste Branch - DNREC

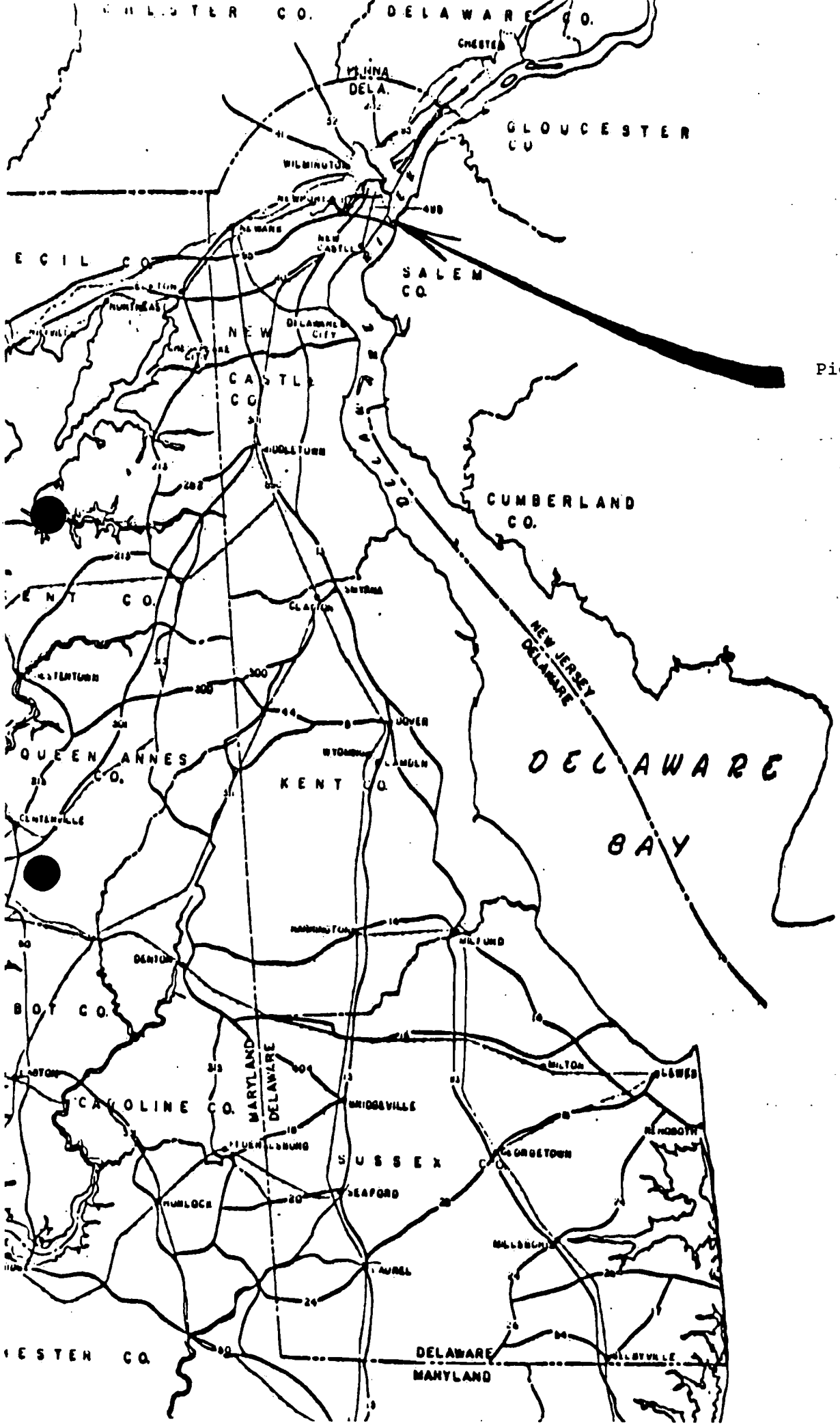
Phone No.: 302-736-4781

Time on Site: 10:00 - 11:30 a.m. 3/22/84

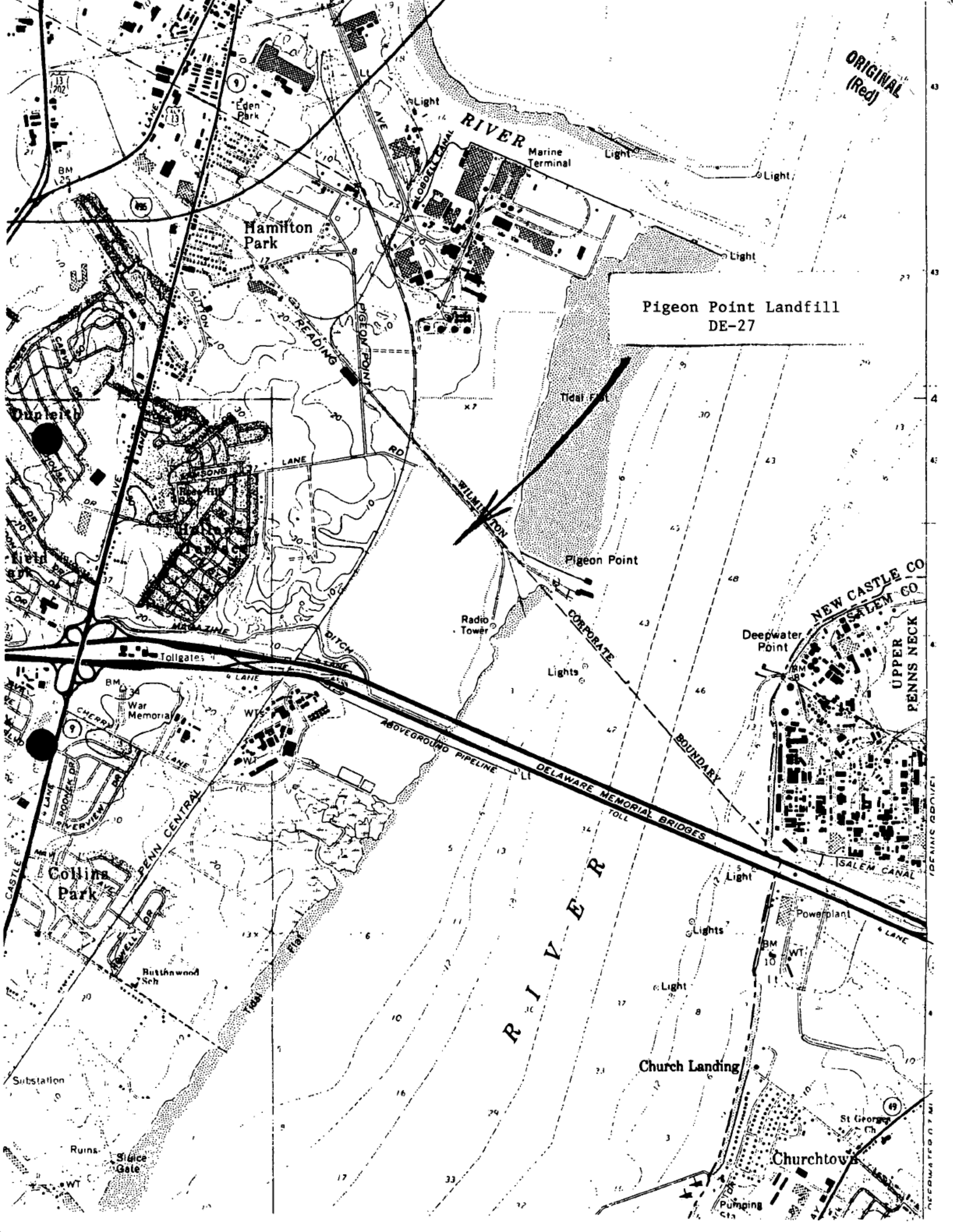
Weather Conditions: 50°F partly cloudy

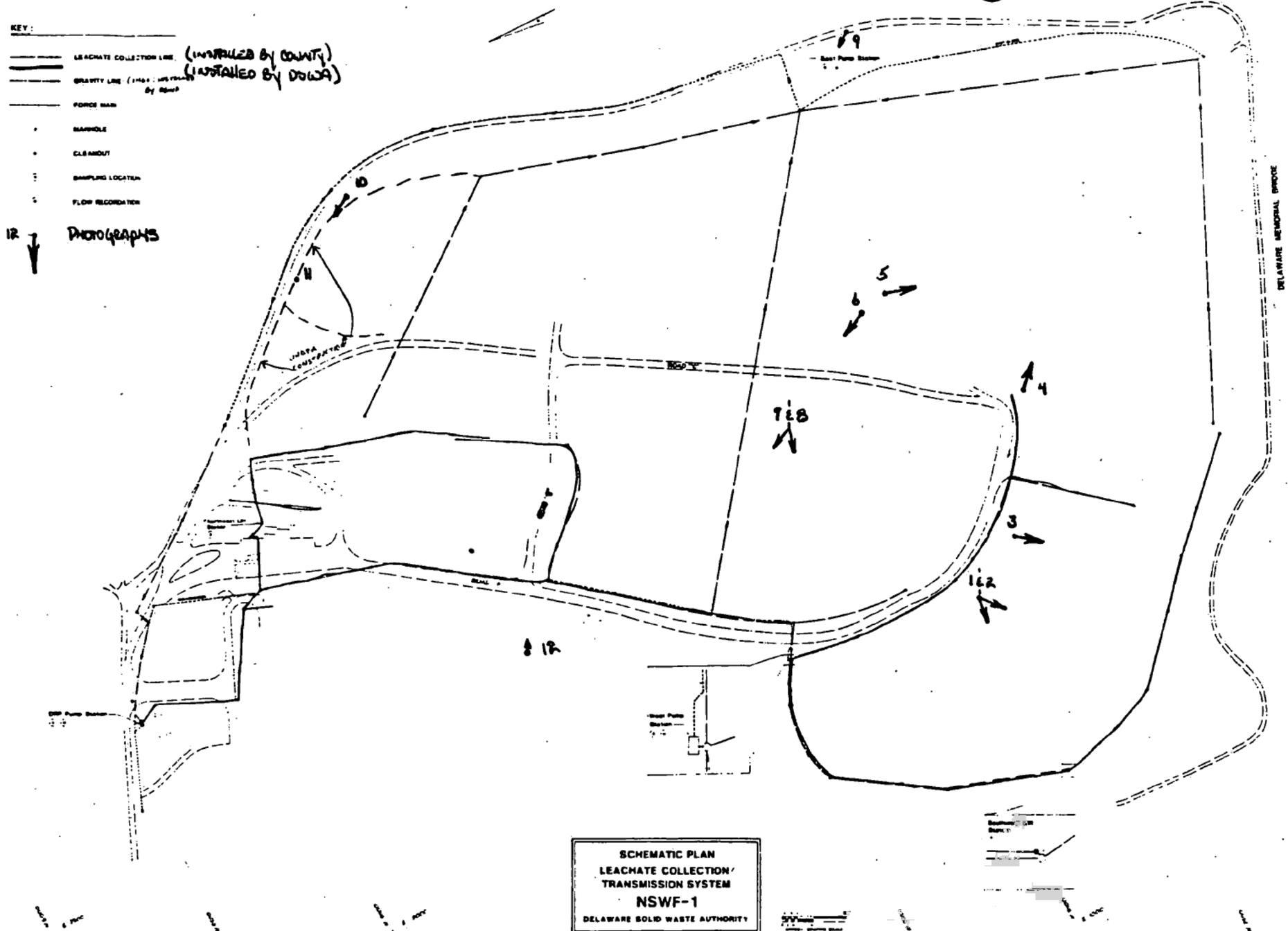
VI. Maps and Drawings

ORIGINAL (Red)



Pigeon Point Landfill
DE-27


ORIGINAL (Red)
Pigeon Point Landfill
DE-27
RIVER
Marine Terminal
Light
Eden Park
Hamilton Park
READING
PIGEON POINT
Tidal Flat
WILMINGTON
Pigeon Point
CORPORATE BOUNDARY
Radio Tower
Lights
Tollgates
MAGAZINE
LANE
DITCH
War Memorial
ABOVEGROUND PIPELINE
DELAWARE MEMORIAL BRIDGES
TOLL
NEW CASTLE CO
SALEM CO
Deepwater Point
UPPER PENNS NECK
SALEM CANAL
Powerplant
Collins Park
PENN CENTRAL
RIVERVIEW
Buttonwood Sch
Substation
Ruins
Sluice Gate
Tidal Flat
R I V E R
Church Landing
Churchtown
St Georges Ch
Pumping Sta

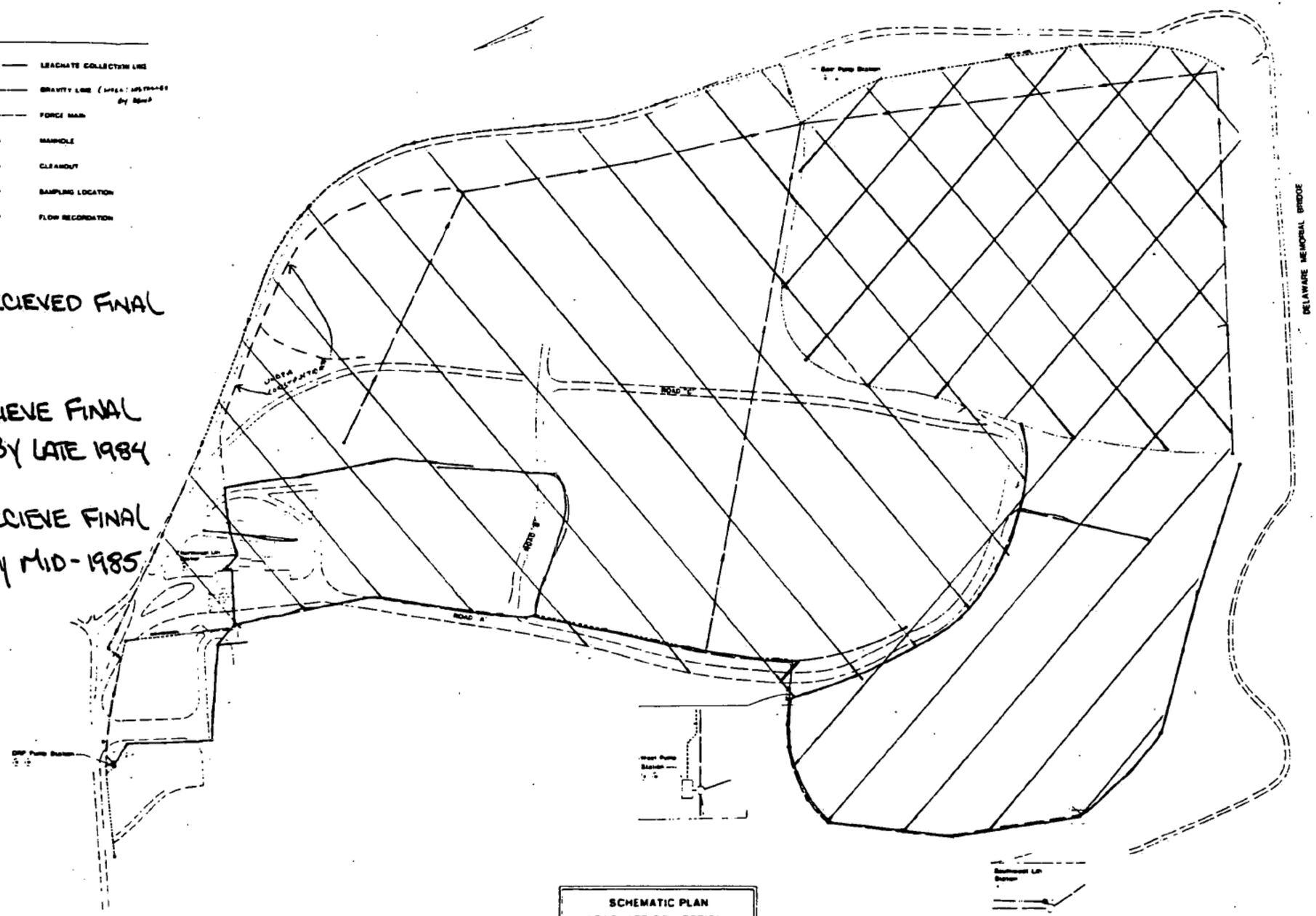


ORIGINAL (Red)

KEY:

- LEACHATE COLLECTION LINE
- GRAVITY LINE
- FORCE MAIN
- MANHOLE
- CLEANOUT
- SAMPLING LOCATION
- FLOW RECORDATION

- ⊠ - HAS RECIEVED FINAL COVER
- ▨ - WILL RECIEVE FINAL COVER BY LATE 1984
- ▨ - WILL RECIEVE FINAL COVER BY MID-1985



SCHEMATIC PLAN
LEACHATE COLLECTION
TRANSMISSION SYSTEM
NSWF-1
DELAWARE SOLID WASTE AUTHORITY

ORIGINAL (Red)

VII. Photographs

Photographs

#1 and #2

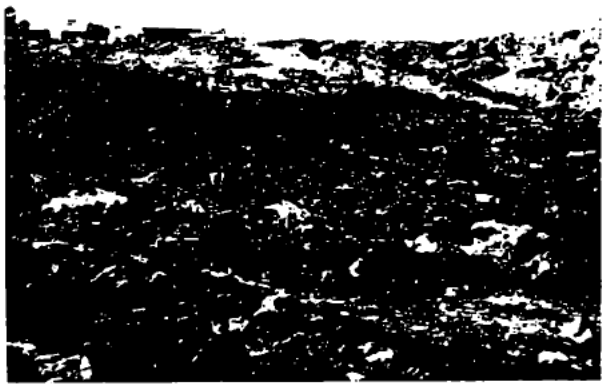
Typical waste and debris on active face. This waste is covered daily.

#3

Typical humus produced at the landfill's recovery plant. This humus will be mixed with a Type G (heavy silt-clay subsoil) fill, then applied as daily cover to the landfill.

#4

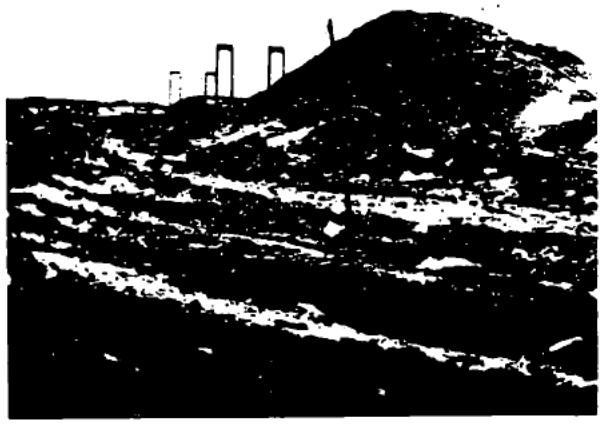
Typical Type G fill used for landfill cover.



1

2

3



4

ORIGINAL (Red)

#5

Final cover with vegetated surface in the background.

#6

Final cover with active fill in the background.

#7

Paint sludge mixed with fill on an active face.

#8

Small quantity waste disposal area.

5

6

7

8

#9

East pump station for the east leachate collection system (see map).

#10

Final section of the leachate collection system under construction. Note snythetic liner which is placed under the perforated PVC lines. This section will be completed in mid-April, 1984 (seemap).

#11

Close up of the synthetic liner.

#12

Humus produced at the recovery plant.

9

10

11

12

VIII. References

Reference

1. "A Preliminary Assessment of Pigeon Point Landfill; New Castle, Delaware" Ecology and Environment, Inc., Field investigation team, Region III, EPA, 1980.

2. "A Geological Assessment of Pigeon Point Landfill" Ecology and Environment, Inc. Region III EPA, 1980.

3. "Report on Pigeon Point Landfill, New Castle, Delaware", Alton Day Stone, Ecology and Environment, Inc., Region III EPA, 1980.

4. Landfill files, Water Resources Section, Delaware Dept. of Natural Resources and Environmental Control.

5. Solid Waste files, Solid Waste Management Branch, Delaware Dept. of Natural Resources and Environmental Control.

6. Erik Schaffer, Delaware Solid Waste Authority, March, 1982.

7. Jim Rohrbach, Delaware Solid Waste Authority, February, 1984.

8. Kenneth Weiss, Delaware Dept.of Natural Resources and Environmental Control, Solid Waste Branch, April, 1984.

9. Michael Apgar, Delaware Dept.of Natural Resources and Environmental Control, Water Resources Section, April 11, 1984.

Appendix A

DUFFIELD ASSOCIATES
Consulting Geotechnical Engineers

BOX 505
NEWARK, DELAWARE 19711
302-738-0703

June 18, 1981

Mr. P. S. Canzano, P. E.
Chief Engineer
Delaware Solid Waste Authority
P. O. Box 455
Dover, DE 19901

W. O. 260-B
RE: Northern Solid Waste Facility-1
Quarterly Water Level Data

Dear Mr. Canzano:

For your information, we are transmitting water level elevation data, measured on 26 through 28 May 1981 during performance of groundwater sampling for routine quarterly monitoring. These are presented on the enclosed table. The table summarizes these data based on geologic strata and, as such, can be used to evaluate piezometric potential or groundwater head conditions within successive strata. In general the observed piezometric level within the Columbia (Pleistocene) Formation and Potomac Formation sands are lower than those observed for the overlying marsh/hydraulic fill stratum, which contains the water-table. Typically, the water-table appears to be above elevation +10 ft.; while the observed piezometric level within the Pleistocene sand is below elevation +5 ft., and the general level within the larger sand strata of the Potomac Formation appears to be below sea level. These data indicate a downward flow gradient from the water-table to the underlying formations. Also, these data suggest potential southwesterly flow within the Pleistocene and southeasterly flow within the Potomac.

As we have previously discussed, the build-up of a water mound within the refuse fill is probable. This mound, which has not been verified due to the lack of centrally located observation wells, would have hydraulic continuity with the groundwater beneath the fill and would, therefore, represent the water-table. This would result in radial groundwater flow from the mound (i.e. fill area) toward the site perimeter. Although primarily a perimeter system, the water-table observation well data do indicate a mound-like water-table configuration. Those wells, located in closest proximity to the refuse fill (e.g. Ob. Wells 1, 31A, 37), indicate higher water-table positions--(greater than elevation +13 ft.), while the wells, located nearest perimeter discharge areas (e.g. Ob. Wells 28A, 29A, 41, and 42A), indicate lower levels (less than elevation +11 ft.).

ORIGINAL (Red)

These data also suggest the potential for vertical flow within the marsh/hydraulic fill stratum. Piezometric levels, indicated by observation wells screened in deeper zones, are lower than those observed in adjacent shallower wells. This can be illustrated by comparing elevation differences between Wells 32A (shallow) and 32 (deep), and 42 (shallow) and 42A (deep). This difference indicates a downward gradient through the stratum. As discussed above, this downward gradient is continued in the underlying Pleistocene and Potomac sands. In general, there appears to be potential hydraulic continuity from the landfill, through the marsh/hydraulic stratum, to these underlying formations. The potential for leachate migration into the deeper formations by this vertical flow is partially offset, but not eliminated, by the low permeability of the clayey silt sediments of the marsh/hydraulic fill stratum.

The enclosed table should be suitable for submission to the Department of Natural Resources and Environmental Control in fulfillment of the State permit (SW-75/01) requirement No. 9 for water level monitoring. The Department has deleted, by its letter of 22 December 1980, the requirement for a potentiometric map of the water-table aquifer. The Department also indicated a willingness to discuss the need for preparation of a Potomac potentiometric map. It is our opinion that, because of formation non-homogeneity and the limited information available a Potomac map would not be accurate.

If you have any questions regarding the above, please contact us.

Very truly yours,

DUFFIELD ASSOCIATES, INC.

Not responsive based on revised scope
Not responsive based on revised scope
Not responsive based on revised scope
Not responsive based on revised scope

CKE/JMB:ch
Enc. Table

ORIGINAL (Red)

Tyler Power ... G.W. elevations

GROUNDWATER LEVEL ELEVATION*
Northern Solid Waste Facility-1

	Date					
	Feb. 1981	May 1981	Sept. 1981	Dec. 1981	Feb. 1982	May 1982
Recent Deposits & Dredge Spoils (Water-Table Wells)						
1	13.0 ft.	13.6 ft.	13.5 ft.	13.1 ft.	12.9 ft.	12.9 ft.
28A	11.7 ft.	10.4 ft.	10.2 ft.	13.0 ft.	13.55 ft.	12.5 ft.
29A	9.3 ft.	10.5 ft.	8.8 ft.	10.7 ft.	11.15 ft.	9.9 ft.
31A	15.5 ft.	16.2 ft.	15.7 ft.	16.3 ft.	16.2 ft.	16.8 ft.
32A	12.9 ft.	12.8 ft.	12.1 ft.	13.0 ft.	13.2 ft.	12.7 ft.
37	13.2 ft.	15.5 ft.	15.1 ft.	14.0 ft.	13.85 ft.	15.55 ft.
39	10.8 ft.	10.7 ft.	10.6 ft.	10.9 ft.	10.85 ft.	10.55 ft.
41	1.2 ft.	1.5 ft.	0.9 ft.	1.0 ft.	2.2 ft.	2.55 ft.
42	9.6 ft.	9.7 ft.	8.0 ft.	9.8 ft.	10.2 ft.	9.35 ft.
51 40						14.65 ft.
(Deeper Zone Wells)						
24	0.4 ft.	0.9 ft.	0.8 ft.	---	---	---
32	11.9 ft.	12.5 ft.	12.9 ft.	13.6 ft.	13.3 ft.	12.9 ft.
37A	11.2 ft.	11.4 ft.	13.4 ft.	12.6 ft.	12.5 ft.	13.2 ft.
42A	8.5 ft.	9.1 ft.	8.0 ft.	8.4 ft.	8.9 ft.	8.8 ft.
Pleistocene Sands						
1A	3.8 ft.	4.3 ft.	4.0 ft.	3.9 ft.	4.2 ft.	4.5 ft.
25	3.5± ft.	3.8± ft.	**	**	**	**
25(R)				0.8 ft.	3.45 ft.	1.8 ft.
27	0.3± ft.	0.1± ft.	**	**	**	**
27(R)				0.25 ft.	2.75 ft.	3.25 ft.
50						4.5 ft.
Potomac Sands						
26	-3.7± ft.	---	**	**	**	**
26(R)				-1.35 ft.	-0.3 ft.	-1.2 ft.
28	-1.3± ft.	-3.3 ft.	-0.5 ft.	-0.4 ft.	0.05 ft.	0.4 ft.
29	-3.9 ft.	-5.3 ft.	-4.0 ft.	-2.8 ft.	-2.75 ft.	-4.8 ft.
31	3.2 ft.	3.4 ft.	3.3 ft.	3.2 ft.	5.0 ft.	4.65 ft.
41A	-0.7 ft.	0.0 ft.	0.2 ft.	-0.3 ft.	0.3 ft.	0.95 ft.
45						
Interior (Base of) Landfill						
46						43± ft.
47						32.9 ft.
48						49.25 ft.
49						17.25 ft.

* N.G.S. 1929 Sea Level Datum

** Observation Well Abandoned

W. O. 115

June 27, 1980

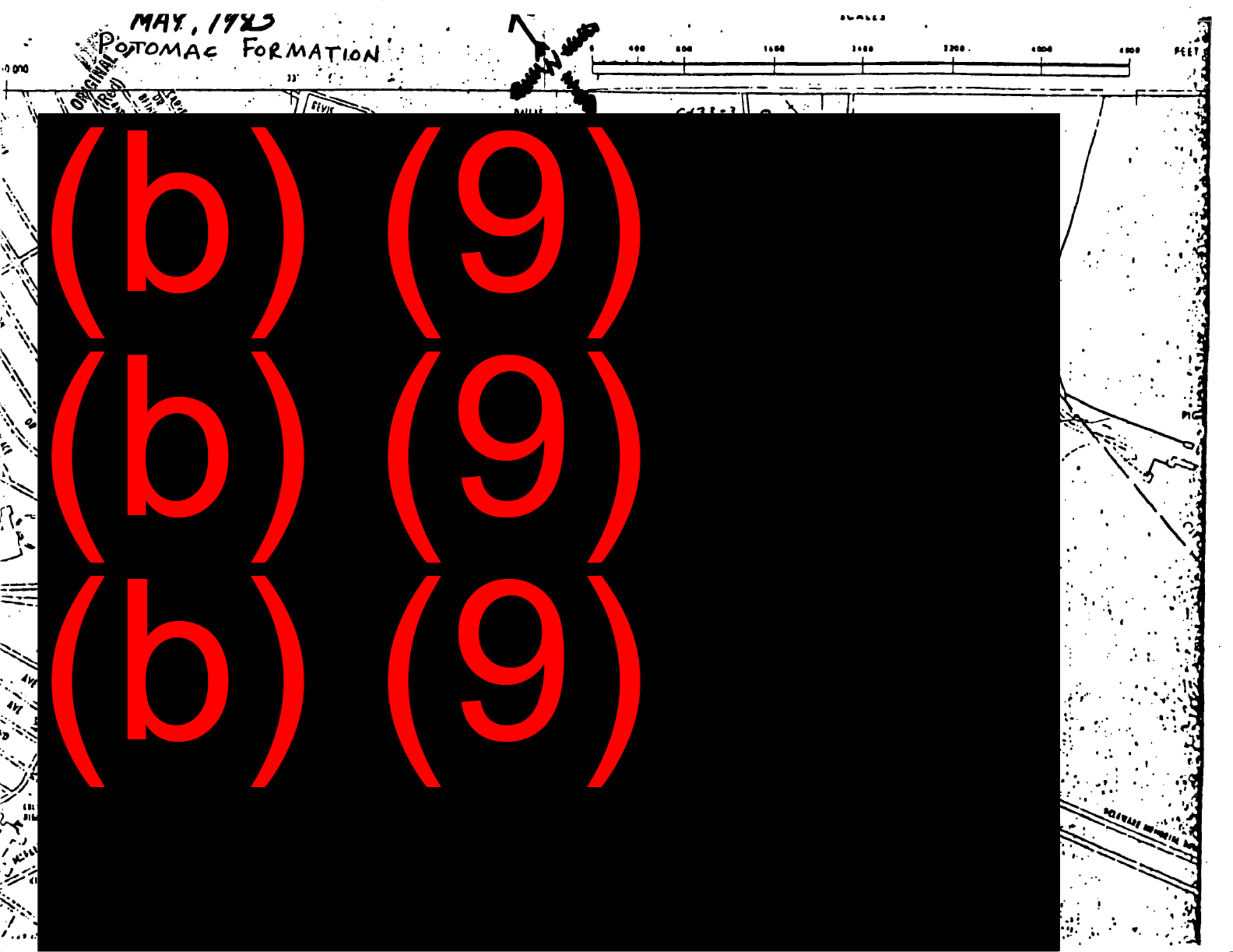
ORIGINAL (Red) FILE

Construction Summary
OPERATIONAL MONITOR WELLS
Pigeon Point Landfill

Monitor Well Identification	Installation Date	Elevation (N.G.S. datum) Surface (Approx.)	Top of Casing	Screen Bottom	Probable Formation
1	Mar. 1976	21 ft.	23.4 ft.	6.0 ft.	Marsh/Hydraulic Fill
1A	May 1980	21 ft.	22.7 ft.	- 9.8 ft.	Columbia (Pleistocene)
24	May 1975	30 ft.	31.1 ft.	-68 ± ft.	Marsh & "Basal Gravel"
abandoned — 25	Apr. 1975	--- (Not Surveyed) ---			Columbia
abandoned — 26	May 1975	--- (Not Surveyed) ---			Potomac (Cretaceous)
abandoned — 27	May 1975	--- (Not Surveyed) ---			Columbia
28	Mar. 1976	16 ft.	17.8 ft.	-35.4 ft.	Potomac
28A	May 1980	16 ft.	17.8 ft.	1.2 ft.	Marsh/Hydraulic Fill
29	Mar. 1976	14 ft.	17.6 ft.	-35.8 ft.	Potomac
29A	May 1980	14 ft.	15.8 ft.	- 0.8 ft.	Marsh/Hydraulic Fill
31	Mar. 1976	23 ft.	26.6 ft.	-40.1 ft.	Potomac
31A	May 1980	22.5 ft.	24.6 ft.	7.5 ft.	Hydraulic Fill/Marsh
32	Mar. 1976	15 ft.	18.8 ft.	-11.5 ft.	Marsh
32A	May 1980	19.5 ft.	21.3 ft.	3.2 ft.	Hydraulic Fill/Marsh
37	May 1980	18.5 ft.	20.6 ft.	4.0 ft.	Hydraulic Fill/Marsh
37A	May 1980	19 ft.	20.6 ft.	-21.6 ft.	Potomac
39	May 1980	14 ft.	15.9 ft.	- 0.7 ft.	Marsh/Hydraulic Fill
41	May 1980	23 ft.	24.9 ft.	- 1.6 ft.	Marsh/Hydraulic Fill
41A	May 1980	23 ft.	25.0 ft.	-32.3 ft.	Potomac
42	May 1980	18 ft.	19.9 ft.	1.8 ft.	Marsh/Hydraulic Fill
42A	May 1980	18 ft.	19.8 ft.	-22.2 ft.	Marsh


MARSH/HYDRAULIC FILL
MAY 11 1983
(b) (9)
(b) (9)
(b) (9)


COLUMBIA FORMATION
MAY 1983
(b) (9)
(b) (9)
(b) (9)


MAY, 1983
POTOMAC FORMATION
ORIGINAL (Red)
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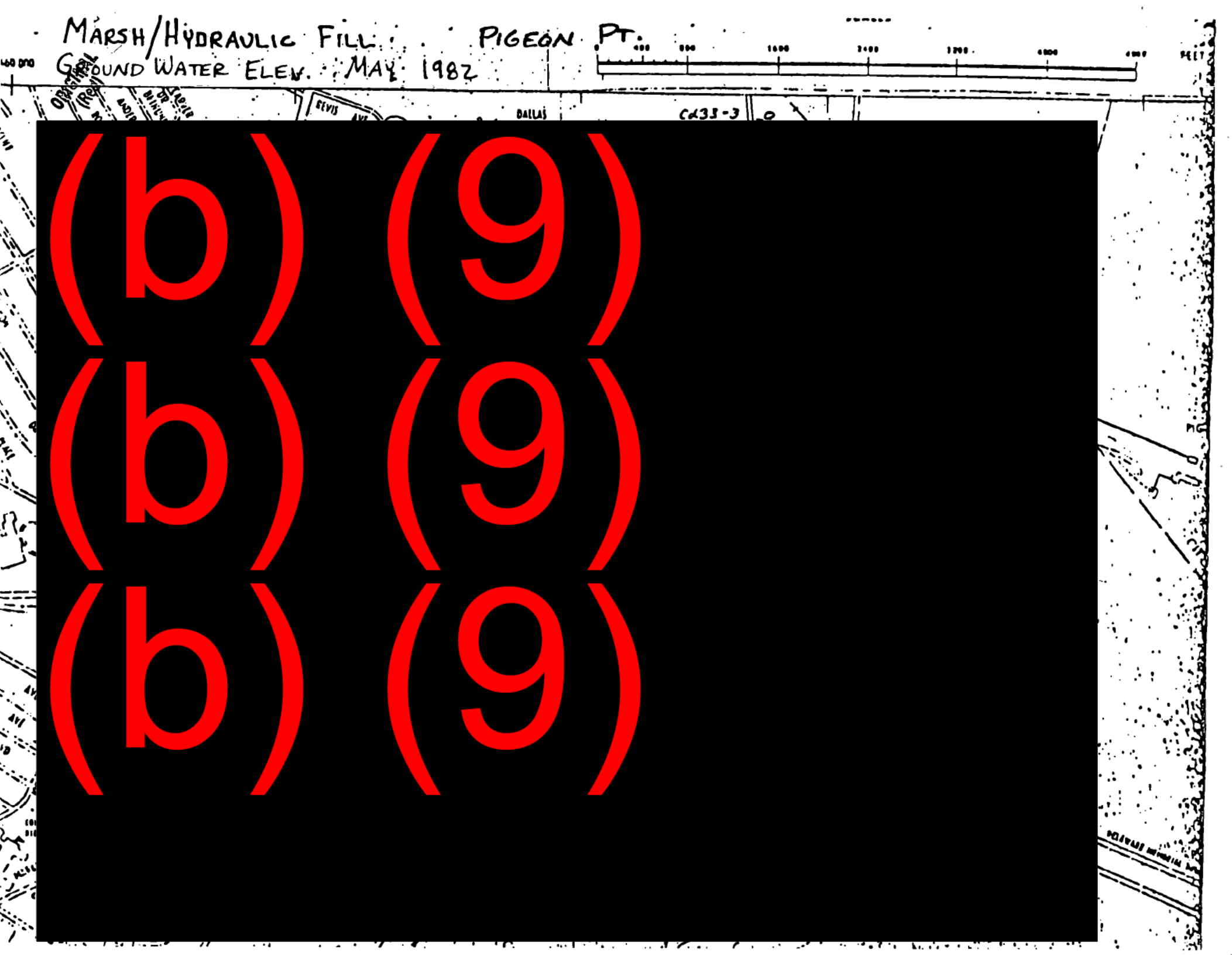
(b) (9)
(b) (9)


MARSH/HYDRAULIC FILL
PIGEON PT.
GROUND WATER ELEV. MAY 1982
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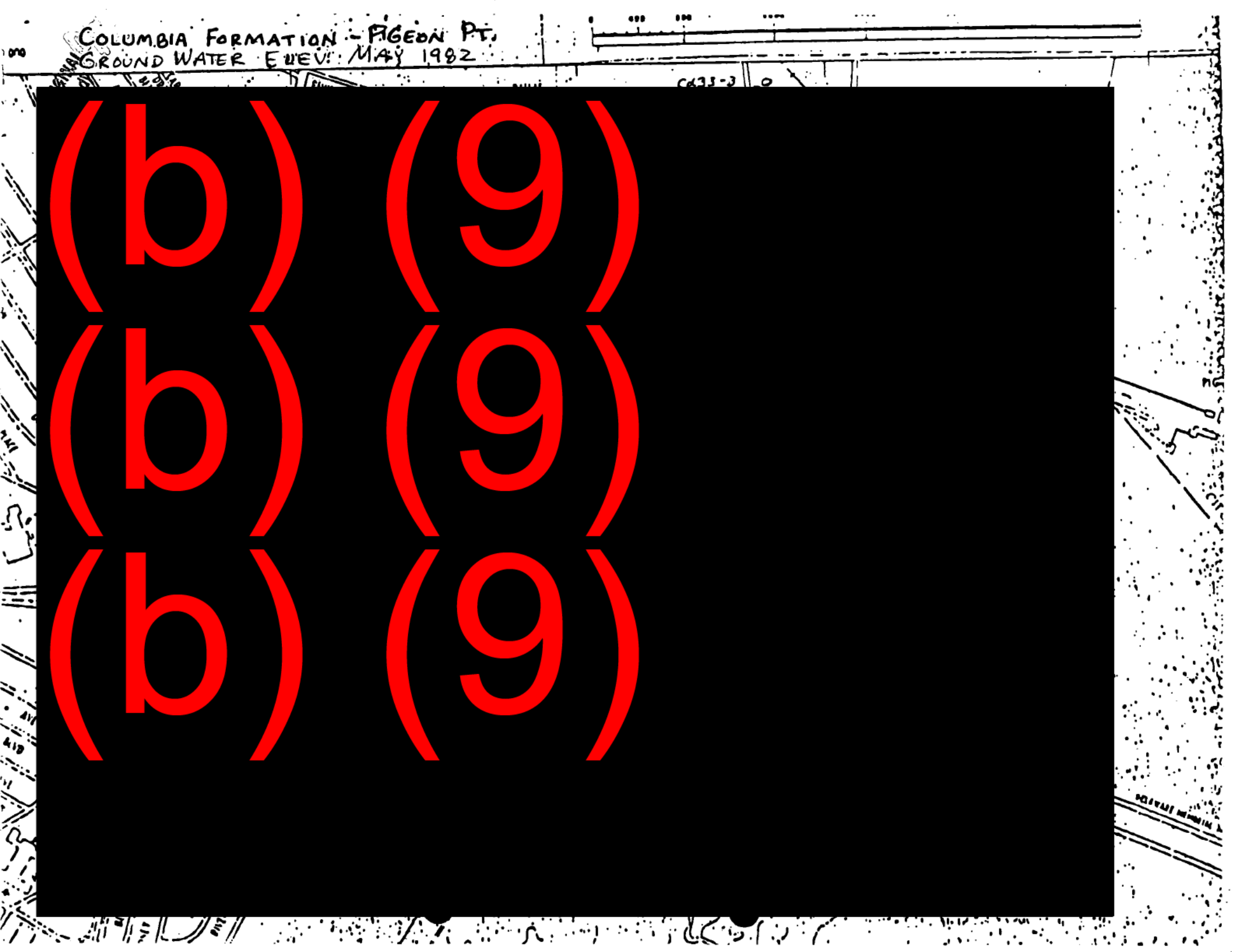
(b) (9)
(b) (9)


COLUMBIA FORMATION - PIGEON PT.
GROUND WATER ELEV: MAY 1982
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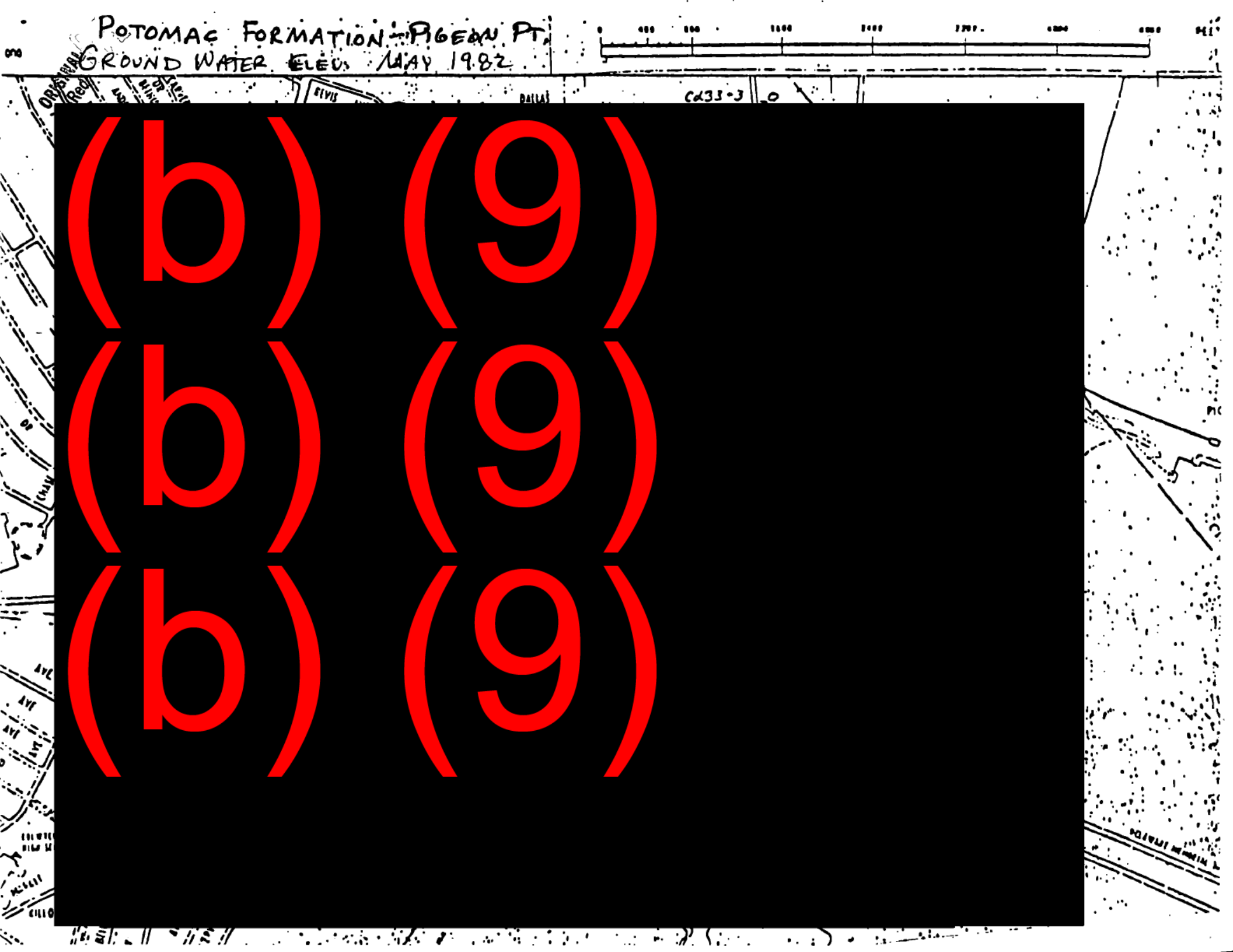
(b) (9)
(b) (9)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GROUND WATER ELEV. MAY 1982
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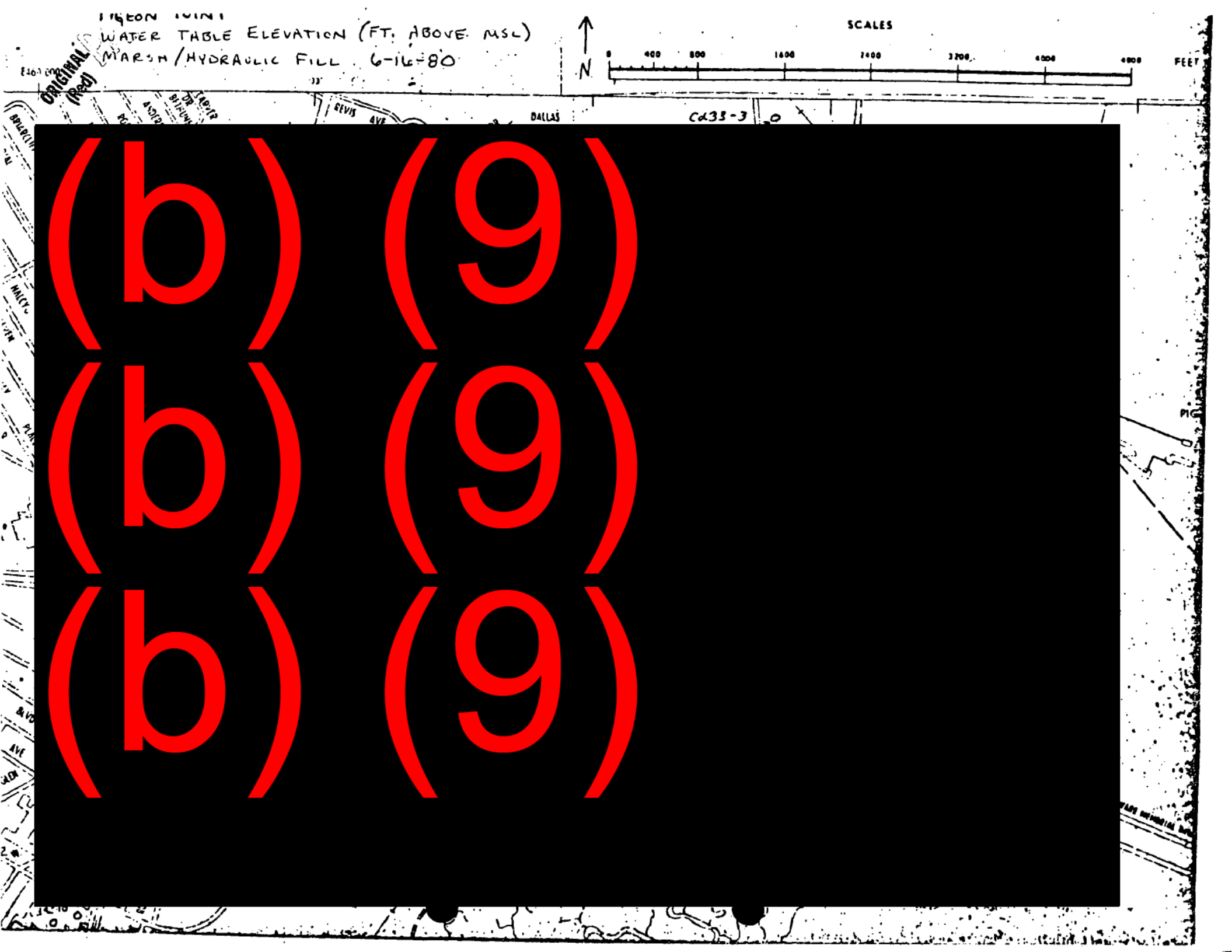
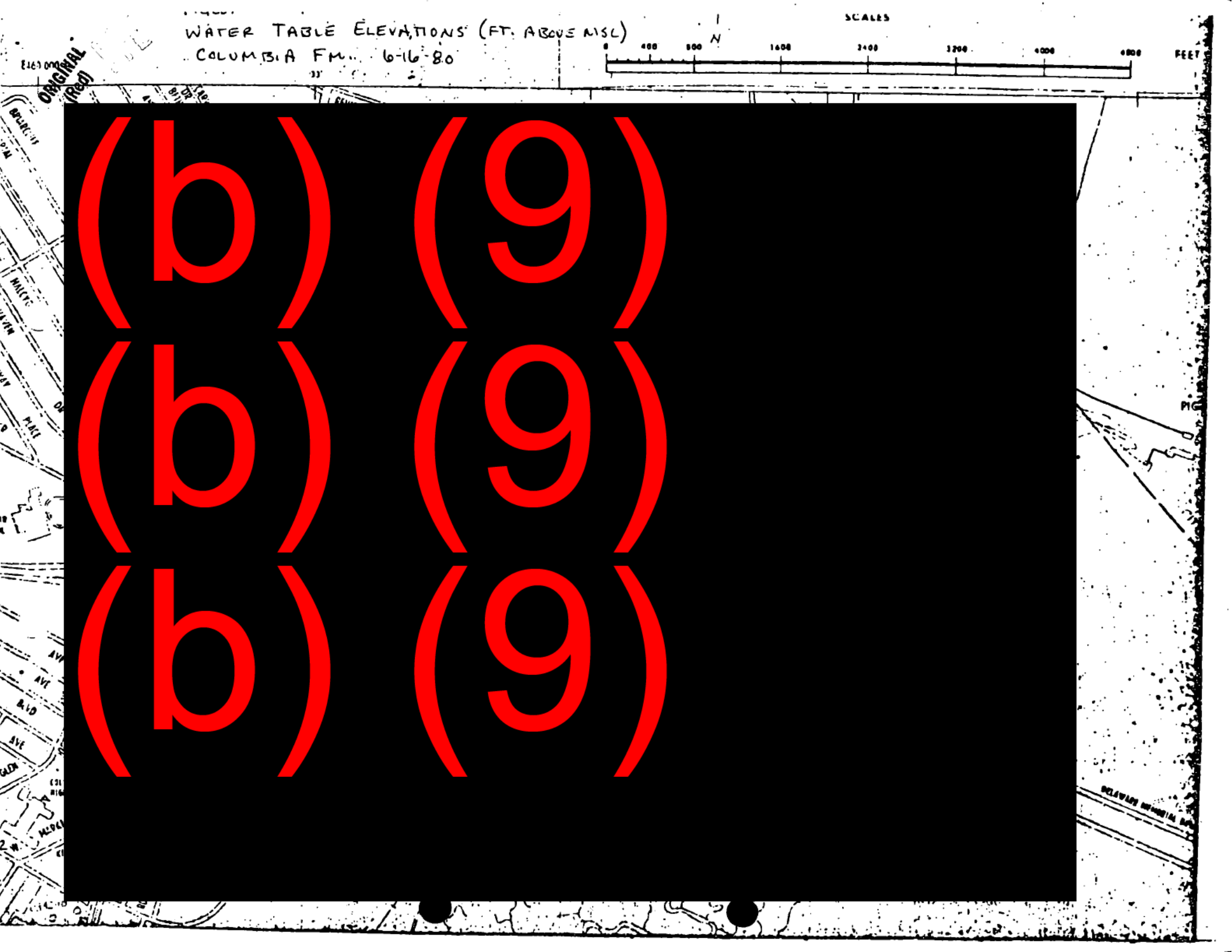
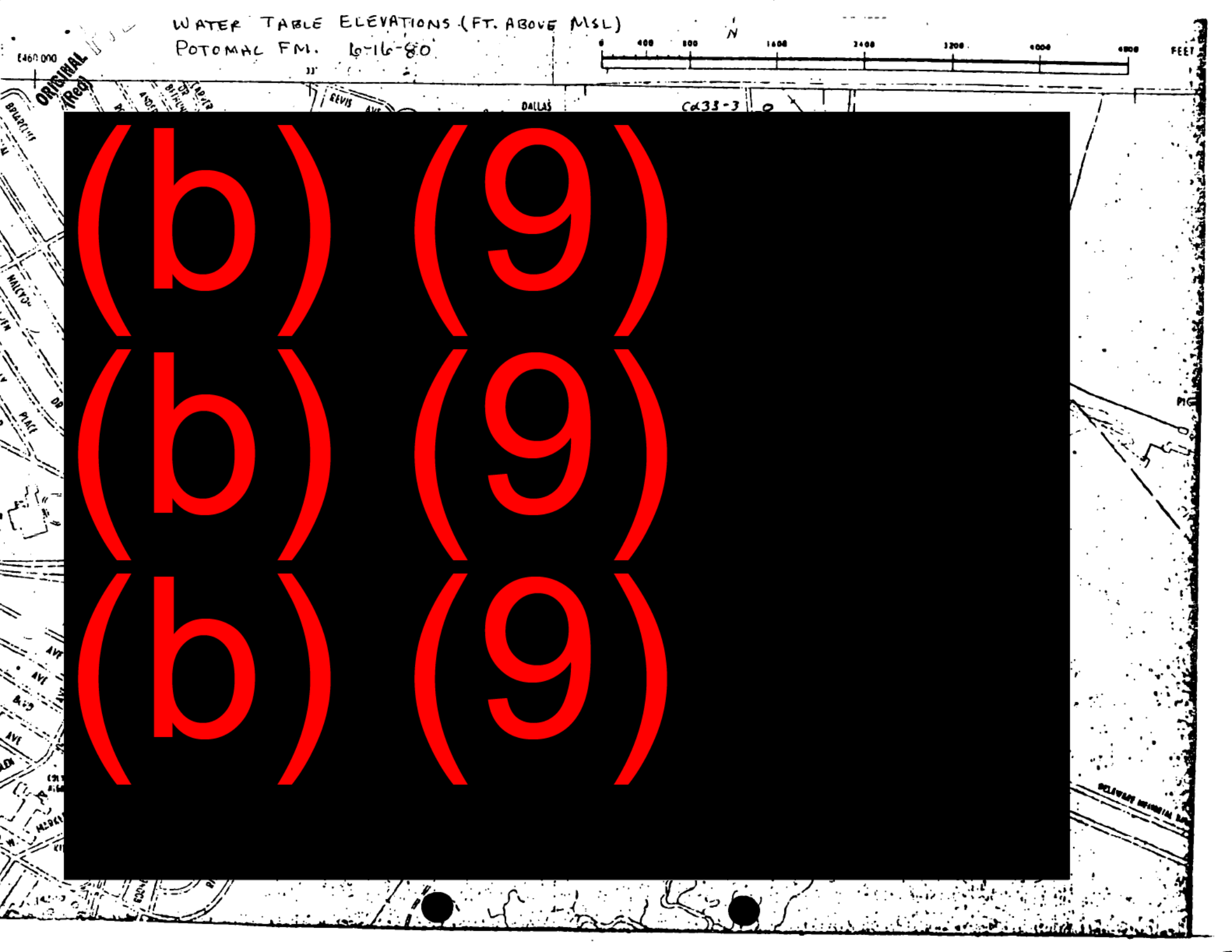

PIGEON POINT
WATER TABLE ELEVATION (FT. ABOVE MSL)
MARSH/HYDRAULIC FILL . 6-16-80
ORIGINAL (Red)
SCALES
N
0
400
800
1600
2400
3200
4000
4800
FEET
DALLAS
CA33-3
(b) (9)
(b) (9)
(b) (9)


WATER TABLE ELEVATIONS (FT. ABOVE MSL)
COLUMBIA FM. 6-16-80
ORIGINAL (Red)
SCALES
N
FEET
(b) (9)
(b) (9)
(b) (9)


WATER TABLE ELEVATIONS (FT. ABOVE MSL)
POTOMAC FM. 6-16-80
ORIGINAL (Red)
E460 000
N
0 400 800 1600 2400 3200 4000 4800 FEET
DALLAS
CA33-3
(b) (9)
(b) (9)
(b) (9)

ORIGINAL (Red)

OUFFIELD ASSOCIATES, INC.

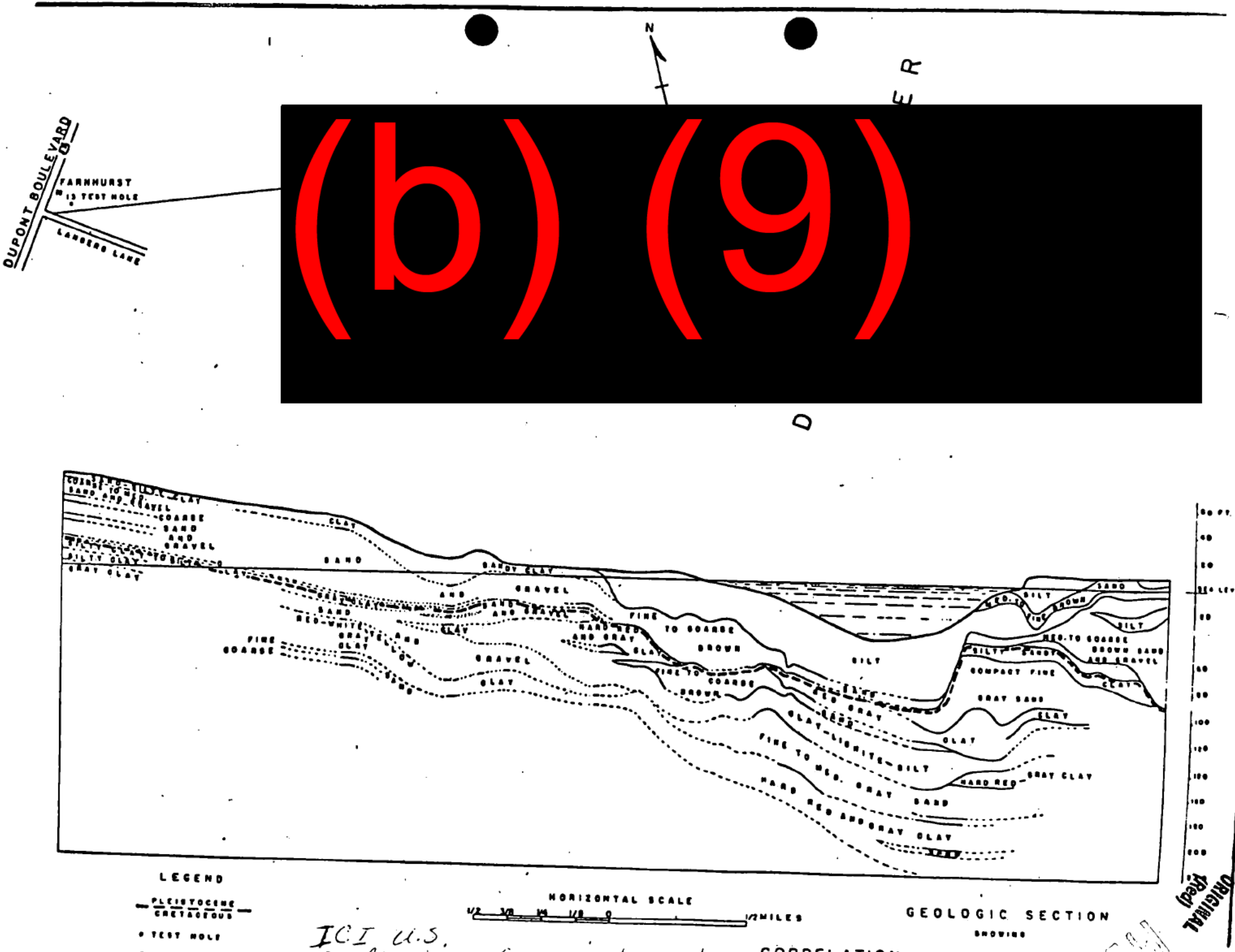
Consulting Geotechnical Engineers

Water Level Field Data Sheet

Project Pig Pt. W. O. No. 115

Date 6/16 - 6/19/90 Page 1 of 1 Tested by J.T.R. Calc. by G.K.E. Checked by

M. P. No.	T.O.C. Ref. Elev.	T.O.C. Water Depth	Water Elev.	T.O.C. Bott. Depth	Bott. Elev.	Stick Up	Dia. of Pipe	Remarks
1	23.4	10.3	13.1	17.4	6.0			Marsh / Hydraulic Fill
7	22.7	18.4	4.3	32.5	-9.8			Columbia (Pleist.)
24	31.1	30.9	0.2	96.5 ±				Marsh + "Basal Gravel"
25								Columbia
26								Potomac (Creta.)
27								Columbia
28	17.8	19.0	-1.2	53.2	-35.4			Potomac
28A	17.8	6.1	11.7	16.6	1.2			Marsh / Hydraulic Fill
29	17.6	25.1	-7.5	53.4	-35.8			Potomac
29A	15.8	5.3	10.5	16.6	-0.8			Marsh / Hydraulic Fill
[illegible]	26.6	22.9	[illegible]	66.7	-40.1			Potomac
31A	24.6	8.7	15.9	17.1	7.5			Hydraulic Fill / Marsh
32	18.8	6.3	12.5	30.3	-11.5			Marsh
32A	21.3	8.6	12.7	18.1	3.2			Hydraulic Fill / Marsh
37	20.6	5.3	15.3	16.6	4.0			Hydraulic Fill / Marsh
37A	20.6	9.1	11.5	42.2	-21.6			Potomac
39	15.9	5.0	10.9	16.6	-0.7			Marsh / Hydraulic Fill
41	24.9	23.3	1.6	26.5	-1.6			Marsh / Hydraulic Fill
41A	25.0	25.3	-0.3	57.3	-32.3			Potomac
42	19.9	10.0	9.9	18.1	[illegible]			Marsh / Hydraulic Fill
42A	19.8	10.1	9.7	42.0	-22.2			Marsh



LEGEND

PLEISTOCENE
CRETACEOUS

TEST HOLE

WELL

HORIZONTAL SCALE

1/2 3/8 1/4 1/8 0 1/2 MILES

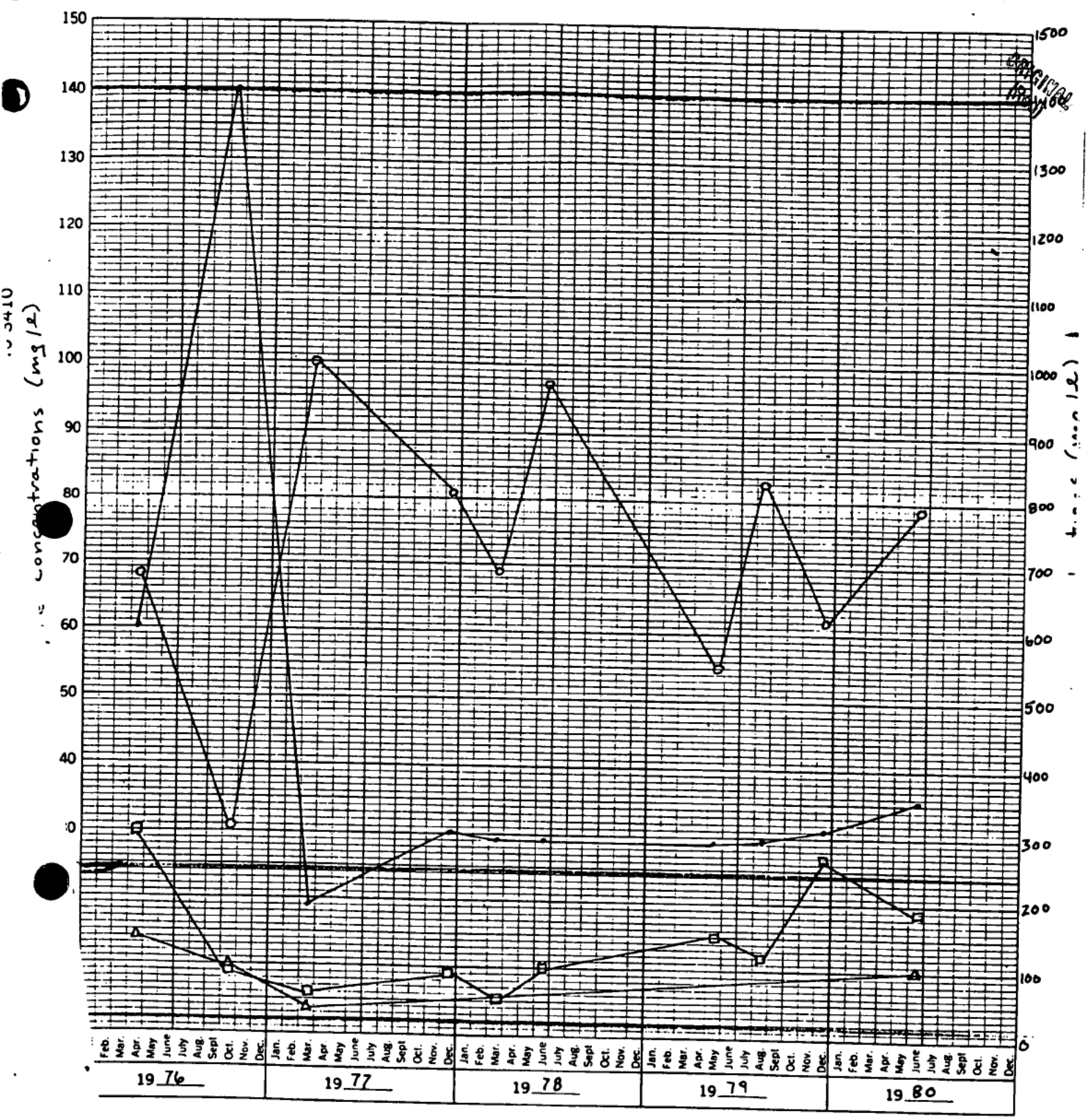
GEOLOGIC SECTION

SHOWING

CORRELATION OF CRETACEOUS ... PLEISTOCEN

ICI U.S. Pat.

Geo. x-section at



COD
TKN
Fe
Cl

PIGEON POINT LANDFILL

WELL 28 - POTOMAC

-Cl background at Area A

-Fe

ORIGINAL (Red)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

DATE : October 9, 1987

SUBJECT: Pigeon Point Landfill; Water Samples for VOC's by GC/MS
Superfund-Remedial TFA03N9ZZ; (9/29/87 - 10/5/87), 870925-01-10

FROM : Rick Dreisch RD
Chemist
Ruth Lopez RL
Environmental Engineer

TO : Daniel K. Donnelly
Chief, Annapolis Laboratory

THRU: John Austin JA
Team Leader, Organic Analysis Section

The above samples were analyzed for the presence of volalite organic compounds amenable to purge and trap and identificable by GC/MS.

Sample Description:

Lab No.	Description
870925-01	Pigeon Point Landfill, MW25R, STA MW25R
870925-02	Pigeon Point Landfill, MW28, STA MW28
870925-03	Pigeon Point Landfill, MW26R, STA MW26R
870925-04	Pigeon Point Landfill, MW27R, STA MW27R
870925-05	Pigeon Point Landfill, MW50, STA MW50
870925-06	Pigeon Point Landfill, MW51, STA MW51
870925-07	Pigeon Point Landfill, MW29, STA MW29
870925-08	Pigeon Point Landfill, MW31, STA MW31
870925-09	Pigeon Point Landfill, MW52, STA MW52
870925-10	Pigeon Point Landfill, MW45, STA MW45

QA Summary:

	Average % Recovery 9/29/87
Bromochloromethane	78 ± 11
1,4-Dichlorobutane	120 ± 12
Para-Bromofluorobenzene	117 ± 14
n =	12

RD/RL:nt

cc: Peggy Zawodny PZ
QCO

ORIGINAL (Red)

Standard Equatable Compound Reference List

NO	NAME	Normal Quantitation Limit (NQL)
1	BROMOCHLOROMETHANE (IS)	n/a (ug/L)
2	CHLOROMETHANE	10
3	VINYL CHLORIDE	10
4	BROMOMETHANE	10
5	CHLOROETHANE	10
6	ACETONE	10
7	1,1-DICHLOROETHYLENE	5
8	METHYLENE CHLORIDE	5
9	CARBON DISULFIDE	10
10	TRANS-1,2-DICHLOROETHYLENE	5
11	1,1-DICHLOROETHANE	5
12	VINYL ACETATE	10
13	2-BUTANONE	5
14	CHLOROFORM	5
15	1,1,1-TRICHLOROETHANE	5
16	1,2-DICHLOROETHANE	5
17	BENZENE	5
18	CARBON TETRACHLORIDE	5
19	1,2-DICHLOROPROPANE	10
20	TRICHLOROETHYLENE	5
21	BROMODICHLOROMETHANE	5
22	2-BROMO-1-CHLOROPROPANE (IS)	n/a
23	(2-CHLOROETHOXY)-ETHENE	10
24	CIS-1,3-DICHLOROPROPYLENE	5
25	4-METHYL-2-PENTANONE	5
26	TRANS-1,3-DICHLOROPROPYLENE	5
27	TOLUENE	5
28	1,1,2-TRICHLOROETHANE	5
29	2-HEXANONE	5
30	DIBROMOCHLOROMETHANE	5
31	TETRACHLOROETHYLENE	5
32	CHLOROBENZENE	5
33	ETHYL BENZENE	5
34	1,4-DICHLOROBUTANE (IS)	n/a
35	*M-XYLENE & P-XYLENE	5
36	BROMOFORM	10
37	STYRENE	5
38	O-XYLENE	5
39	1,1,2,2-TETRACHLOROETHANE	10
40	PARA-BROMOFLUOROBENZENE (MSIS)	n/a
41	1,3-DICHLOROBENZENE	5
42	1,4-DICHLOROBENZENE	5
43	1,2-DICHLOROBENZENE	5

* Calculated from M-XYLENE ISOMER

ORIGINAL (Red)

Data: 870925-01
Sample: STA MW25R
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL Analysts: Ruth Lopez, Rick Dreisch

No Compounds Found

++

Data: 870925-02
Sample: STA MW28
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL

NO	NAME	Scan	Amount
35	M-XYLENE	2146	0.2J ug/L
	Non-Standard Equatable Compounds Found		
	Tetrahydro-2,5-Dimethyl Furan	1610	1.0J
	2,5-Dimethyl Thiophene	2149	3.7J

++

Data: 870925-03
Sample: STA MW26R
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL

	Non-Standard Equatable Compounds Found		
	Trimethyl Hydrazine	2094	0.8J

++

Actual Quantitation Limit = MQL * Dilution Factor (DF)
J = Estimated value, <MQL * DF, presence of compound indicated.
Dilution Factor = 1 unless specified

ORIGINAL (Red)

Data: 870925-04
Sample: STA MW27R
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL

No Reportable Compounds Found

++

Data: 870925-05
Sample: BLANK STA #50
Conds.: PICEON POINT LANDFILL
Submitted by: CRL

Non-Standard Equatable Compounds Found

2-Butene isomer	909	0.8J ug/L

++

Data: 870925-06
Sample: STA MW51 1X
Conds.: PIGECN POINT LANDFILL
Submitted by: CRL

NO	NAME	Scan	Amount
17	BENZENE	1493	0.2J

++

Data: 870925-07
Sample: STA MW29
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL

NO	NAME	Scan	Amount
17	BENZENE	1490	0.2J
35	M-XYLENE	2145	0.1J

++

Data: 870925-08
Sample: STA MW31
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL

NO	NAME	Scan	Amount
3	VINYL CHLORIDE	907	12.7
20	TRICHLOROETHYLENE	1613	0.2J
33	ETHYL BENZENE	2147	0.2J

++

Actual Quantitation Limit = NQL * Dilution Factor (DF)
J = Estimated value, <NQL * DF, presence of compound indicated.
Dilution Factor = 1 unless specified

ORIGINAL (Red)

Data: 870925-09
Sample: BLANK STA MW52
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL

NO	NAME	Scan	Amount
35	M-XYLENE	2147	0.1J [redacted]/L

++

Data: 870925-10
Sample: STA MW45
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL

No Compounds Found

++

Data: 870925-10B
Sample: DUPLICATE 870925-10
Conds.: PIGEON POINT LANDFILL
Submitted by: CRL

No Compounds Found

++

Actual Quantitation Limit = MQL * Dilution Factor (DF)
J = Estimated value, <MQL * DF, presence of compound indicated.
Dilution Factor = 1 unless specified

ORIGINAL (Red)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
CENTRAL REGIONAL LABORATORY
839 BESTGATE ROAD
ANNAPOLIS, MARYLAND 21401
(301) 266-9180

DATE : October 20, 1987

SUBJECT: GC/MS Analysis of Samples from Pigeon Point Landfill
Superfund-Remedial (TFA03N9ZZ), (9/27/87 - 10/13/87) 870925-01-10

FROM : Joseph L. Slayton JS
Chemist

Susan Warner SW
Environmental Scientist

TO : Jim Barron
Acting Chief, Annapolis Laboratory

The samples were examined for the presence of organic compounds listed as extractable Priority Pollutant and CLP Hazardous Substances Compound List, using fused silica capillary column/gas chromatography/mass spectrometry. Concentrations of these compounds were determined using the relative response of authentic standards to the closest internal standard. These values have been reported in the Extractable Organics Analysis Target Compound Data Sheet. Only those for which results are reported were detected. Sample target compound values less than the quantitation limit were labeled with a J. This indicates that the mass spectra obtained for the sample met the identification criteria, yet the quantity present was below the level for which the instrument accurately quantitates. These results (J) should be considered estimated quantities. The NQL (nominal quantitation limit) listed in the Target Compound Data Sheet is the quantitation limit that has been determined for this method. The actual quantitation limit for a sample reflects the NQL as well as any dilution/concentration factor specific for each sample.

The samples were also examined for the presence of compounds in addition to those on the Target Compound list. Authentic standards were not available to verify these results. Tentative identification of these compounds was made on the comparison of sample spectra to the EPA/NIH Mass Spectral Library. Concentrations for these compounds were estimated based on the response of the closest internal standard and the assumption that the instrument response for a given tentative compound was the same as the instrument response for the internal standards. These identifications have been reported as tentative identifications with the associated quantitation values reported as estimated concentrations.

All sample extracts have been corrected for any blank contamination. A Field/Equipment blank was not provided with this sample set. A laboratory blank was analyzed.

JSL/SW:nt

cc: Peggy Zawodny PZ
QCO

ORIGINAL (Red)

Sample Description

Lab No.	Description
870925-01	Pigeon Point Landfill, MW25R, STA MW25R
870925-02	Pigeon Point Landfill, MW28, STA MW28
870925-03	Pigeon Point Landfill, MW26R, STA MW26R
870925-04	Pigeon Point Landfill, MW27R, STA MW27R
870925-05	Pigeon Point Landfill, MW50, STA MW50
870925-06	Pigeon Point Landfill, MW51, STA MW51
870925-07	Pigeon Point Landfill, MW29, STA MW29
870925-08	Pigeon Point Landfill, MW31, STA MW31
870925-09	Pigeon Point Landfill, MW52, STA MW52
870925-10	Pigeon Point Landfill, MW45, STA MW45

Region III
Central Regional Laboratory

ORIGINAL (Red)

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-01

Date Sampled: 9-24-87
Date Extracted: 9-27-87
Date Analyzed: 10-6-87

Units: ~~Water = ug/L~~ ~~Soil = ug/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	62-53-34	Aniline HSL	
10	11-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	65-85-0	Benzoic Acid HSL	
10	111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	*
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenze(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamin

Region III
Central Regional Laboratory

ORIGINAL (Red)

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-02

Date Sampled: 9-23-87
Date Extracted: 9-27-87
Date Analyzed: 10-6-87

Units: Water = ug/L
~~Soil = mg/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	62-53-34	Aniline HSL	
10	111-44-4	bis(2-Chloroethyl)Ether	1.0J
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	65-85-0	Benzoic Acid HSL	
10	111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	*
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenzo(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamine

ORIGINAL (Red)

Region III
Central Regional Laboratory

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-03

Date Sampled: 9-24-87
Date Extracted: 9-27-87
Date Analyzed: 10-7-87

Units: ~~Water = ug/L~~
~~Soil = ug/kg~~ (wet)

Semivolatile Compounds

Actual Quantitation Limit = (10) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	[redacted]2-53-34	Aniline HSL	
10	[redacted]11-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	[redacted]65-85-0	Benzoic Acid HSL	
10	[redacted]111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	@0.2J
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	*
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	1.8J
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenz(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamin

ORIGINAL (Red)

Region III
Central Regional Laboratory

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-04

Date Sampled: 9-24-87
Date Extracted: 9-27-87
Date Analyzed: 10-7-87

Units: ~~Water = ug/L~~ ug/L
~~Soil = mg/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	62-53-34	Aniline HSL	
10	111-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	65-85-0	Benzoic Acid HSL	
10	111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	0.7J
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	*
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenzo(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamin

ORIGINAL (Red)

Region III
Central Regional Laboratory

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-05

Date Sampled: 9-23-87
Date Extracted: 9-27-87
Date Analyzed: 10-7-87

Units: Water = ug/L
~~Solid = ug/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	62-53-34	Aniline HSL	
10	111-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	65-85-0	Benzoic Acid HSL	
10	111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenzo(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamir

Region III
Central Regional Laboratory

ORIGINAL (Red)

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-06

Date Sampled: 9-23-87
Date Extracted: 9-27-87
Date Analyzed: 10-7-87

Units: Water = ug/L
~~Soil = ug/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	62-53-34	Aniline HSL	
10	111-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	65-85-0	Benzoic Acid HSL	
10	111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	0.4 J
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	*
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenzo(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamin

ORIGINAL (Red)

Region III
Central Regional Laboratory

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-07

Date Sampled: 9-23-87
Date Extracted: 9-27-87
Date Analyzed: 10-7-87

Units: ~~Water = ug/L~~
~~Soil = ug/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	62-53-34	Aniline HSL	
10	111-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	65-85-0	Benzoic Acid HSL	
10	111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenzo(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamine

ORIGINAL (Red)

Region III
Central Regional Laboratory

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-08

Date Sampled: 9-24-87
Date Extracted: 9-27-87
Date Analyzed: 10-7-87

Units: Water = ug/L
~~Soil = ug/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	[illegible]-53-34	Aniline HSL	
10	111-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	[illegible]5-85-0	Benzoic Acid HSL	
10	111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	0.5J
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	*
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenzo(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamine

Region III
Central Regional Laboratory

ORIGINAL (Red)

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-09

Date Sampled: 9-24-87
Date Extracted: 9-27-87
Date Analyzed: 10-7-87

Units: Water = ug/L
~~Soil = ug/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	
10	[illegible]-53-34	Aniline HSL	
10	[illegible]-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	[illegible]-85-0	Benzoic Acid HSL	
10	[illegible]-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenzo(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamine

ORIGINAL (Red)

Region III
Central Regional Laboratory

Extractable Organics Analysis Target Compound Data Sheet

Sample No. 870925-10

Date Sampled: 9-23-87
Date Extracted: 9-27-87
Date Analyzed: 10-6-87

Units: Water ug/L
Soil ~~ug/kg (wet)~~

Semivolatile Compounds

Actual Quantitation Limit = (1.0) x NQL

NQL	CAS Number		
10	62-75-8	N-Nitrosodimethylamine	
10	108-95-2	Phenol	1.1 J
10	62-53-34	Aniline HSL	
10	111-44-4	bis(2-Chloroethyl)Ether	
10	95-57-8	2-Chlorophenol	
10	541-73-1	1,3-Dichlorobenzene	
10	106-46-7	1,4-Dichlorobenzene	
10	100-51-6	Benzyl Alcohol HSL	
10	95-50-1	1,2-Dichlorobenzene	
10	95-48-7	2-Methylphenol HSL	
10	39638-32-9	bis(2-chloroisopropyl)Ether	
10	106-44-5	4-Methylphenol HSL	
10	621-64-7	N-Nitroso-di-n-Propylamine	
10	67-72-1	Hexachloroethane	
10	98-95-3	Nitrobenzene	
10	78-59-1	Isophorone	
10	88-75-5	2-Nitrophenol	
10	105-67-9	2,4-Dimethylphenol	
50	65-85-0	Benzoic Acid HSL	
10	111-91-1	bis(2-Chloroethoxy)Methane	
10	120-83-2	2,4-Dichlorophenol	
10	120-82-1	1,2,4-Trichlorobenzene	
10	91-20-3	Naphthalene	
10	106-47-8	4-Chloroaniline HSL	
10	87-68-3	Hexachlorobutadiene	
10	59-50-7	4-Chloro-3-Methylphenol	
10	91-57-6	2-Methylnaphthalene HSL	
10	77-47-4	Hexachlorocyclopentadiene	
10	88-06-2	2,4,6-Trichlorophenol	
50	95-95-4	2,4,5-Trichlorophenol HSL	
10	91-58-7	2-Chloronaphthalene	
50	88-74-4	2-Nitroaniline HSL	
10	131-11-3	Dimethylphthalate	
10	208-96-8	Acenaphthylene	

NQL	CAS Number		
50	99-09-2	3-Nitroaniline HSL	
10	83-32-9	Acenaphthene	
50	51-28-5	2,4-Dinitrophenol	
50	100-02-7	4-Nitrophenol	
10	132-64-9	Dibenzofuran HSL	
10	606-20-2	2,6-Dinitrotoluene	
10	121-14-2	2,4-Dinitrotoluene	
10	84-66-2	Diethylphthalate	0.5 J
10	7005-72-3	4-Chlorophenylphenylether	
10	86-73-7	Fluorene	
50	100-01-6	4-Nitroaniline HSL	
10	86-30-6	N-Nitrosodiphenylamine(1)	
50	543-52-1	4,6-Dinitro-2-Methylphenol	
10	101-55-3	4-Bromophenyl-phenylether	
10	118-74-1	Hexachlorobenzene	
50	87-86-5	Pentachlorophenol	
10	85-01-8	Phenanthrene	
10	120-12-7	Anthracene	
10	84-74-2	Di-n-Butylphthalate	*
10	206-44-0	Fluoranthene	
50	92-87-5	Benzidine	
10	129-00-0	Pyrene	
10	85-68-7	Butylbenzylphthalate	
20	91-94-1	3,3'-Dichlorobenzidine	
10	56-55-3	Benzo(a)Anthracene	
10	117-81-7	bis(2-Ethylhexy)Phthalate	
10	218-01-9	Chrysene	
10	117-84-0	Di-n-Octylphthalate	
10	205-99-2	Benzo(b)Fluoranthene	
10	207-08-9	Benzo(k)Fluoranthene	
10	50-32-8	Benzo(a)Pyrene	
10	193-39-5	Indeno(1,2,3-cd)Pyrene	
10	53-70-3	Dibenzo(a,h)Anthracene	
10	191-24-2	Benzo(g,h,i)Perylene	

NQL = Nominal Quantitation Limit
J = Estimated quantity, concentration below the level for accurate quantitation.

*Not detected after correction for laboratory blank.
HSL = CLP Hazardous Substance List Compounds
(1) = Can not be separated from diphenylamine

ORIGINAL (Red)

SAMPLE ID. 87092501

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE IDENTIFICATION	STD.	AREA	EST. CONC. PPB
	D4-1,4-DICHLOROBENZENE*INTERNAL STD. #1			
1048	- -	1	218810.	40.
	*** D8-NAPHTHALENE*** INTERNAL STD. #2			
1094	- -	2	296048.	40.
	D10-ACENAPHTHENE INTERNAL STD. #3			
1454	- -	3	323704.	40.
	2-PROPENOIC ACID, OCTYL ESTER			
1635	2499-59-4	4	4705. TRACE	0.6
	*** D10-PHENANTHRENE***INTERNAL STD.			
1759	- -	4	302761.	40.
	D12-CHRYSENEINTERNAL STD. #5			
2326	- -	5	233050.	40.
	D12-PERYLENEINTERNAL STD. #6			
2835	- -	6	139842.	40.

SAMPLE ID. 87092502

ORIGINAL (Red)

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE IDENTIFICATION	STD.	AREA	EST. CONC. PPB
	D4-1,4-DICHLOROBENZENE*INTERNAL STD. #1			
849	- -	1	228185.	40.
	*** D8-NAPHTHALENE*** INTERNAL STD. #2			
894	- -	2	307144.	40.
	BENZENE, 1,1'-OXYBIS-			
1355	101-84-8	3	31622.	3.8
	D10-ACENAPHTHENE INTERNAL STD. #3			
1453	- -	3	333122.	40.
	CYCLOPROPANE, OCTYL-			
1635	1472-09-9	4	7064. TRACE	1.0
	*** D10-PHENANTHRENE***INTERNAL STD.			
1759	- -	4	294657.	40.
	D12-CHRYSENEINTERNAL STD. #5			
2332	- -	5	230646.	40.
	D12-PERYLENEINTERNAL STD #6			
2844	- -	6	140918.	40.

SAMPLE ID. 87092503

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORIGINAL (Red)

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE IDENTIFICATION	STD.	AREA	EST. CONC. PPB
	D4-1,4-DICHLOROBENZENE*INTERNAL STD. #1			
845	- -	1	244370.	40.
	TRICYCLO[3.3.1.13,7]DECANE			
962	281-23-2	1	1665. TRACE	0.3
	*** D8-NAPHTHALENE*** INTERNAL STD. #2			
1091	- -	2	335888.	40.
	PHOSPHORIC TRIAMIDE, HEXAMETHYL-			
1231	680-31-9	2	22804.	2.7
	CYCLOPENTANE, 1,1-DIMETHYL-			
1416	1638-26-2	3	2019. TRACE	0.2
	D10-ACENAPHTHENE INTERNAL STD. #3			
1453	- -	3	365336.	40.
	*** D10-PHENANTHRENE***INTERNAL STD.			
1760	- -	4	318832.	40.
	D12-CHRYSENEINTERNAL STD. #5			
2332	- -	5	243094.	40.
	D12-PERYLENEINTERNAL STD. #6			
2844	- -	6	152681.	40.

ORIGINAL (Red)

SAMPLE ID. 87092504

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE IDENTIFICATION	STD.	AREA		EST. CONC. PPB
	D4-1,4-DICHLOROBENZENE*INTERNAL STD. #1				
844	- -	1	254401.		40.
	*** D8-NAPHTHALENE*** INTERNAL STD. #2				
1090	- -	2	338669.		40.
	PHOSPHORIC TRIAMIDE, HEXAMETHYL-				
1232	680-31-9	2	3196.	TRACE	0.4
	CYCLOBUTANE, 1,1,2,3,3-PENTAMETHYL-				
1344	57905-86-9	3	1288.	TRACE	0.1
	CYCLOPENTANE, 1,1-DIMETHYL-				
1415	1638-26-2	3	3318.	TRACE	0.3
	D10-ACENAPHTHENE INTERNAL STD #3				
1452	- -	3	379380.		40.
	*** D10-PHENANTHRENE***INTERNAL STD				
1759	- -	4	335426.		40.
	D12-CHRYSENEINTERNAL STD. #5				
2331	- -	5	222171.		40.
	D12-PERYLENEINTERNAL STD. #6				
2842	- -	6	135777.		40.

ORIGINAL (Red)

SAMPLE ID. 87092505

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE ID. / CAS NO.	STD.	AREA	EST. CONC. PPB
	D4-1,4-DICHLOROBENZENE INT. STD. #1			
803	- -	1	146119.	40.
	D8-NAPHTHALENE INT. STD. #2			
1036	- -	2	200995.	40.
	D10-ACENAPHTHENE INT. STD. #3			
1380	- -	3	221786.	40.
	2-PROPENOIC ACID, OCTYL ESTER			
1546	2499-59-4	4	6377.	1.1
	D10-PHENANTHRENE ***INT. STD. ***			
1671	- -	4	230572.	40.
	D12-CHRYSENE INT. STD. #5			
2212	- -	5	86592.	40.
	D10-PERYLENEINTERNAL STD. #6			
2676	- -	6	37769.	40.

SAMPLE ID. 87092506

ORIGINAL (Red)

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE IDENTIFICATION	STD.	AREA	EST. CONC. PPB
	PENTANOIC ACID, 4-METHYL-			
731	646-07-1	1	1658.	TRACE 0.3
	D4-1,4-DICHLOROBENZENE*INTERNAL STD. #1			
847	- -	1	215287.	40
	*** D8-NAPHTHALENE*** INTERNAL STD. #2			
1093	- -	2	282665.	40.
	PROPANOIC ACID, 2-METHYL-, BUTYL ESTER			
1318	97-87-0	3	21266.	2.7
	D10-ACENAPHTHENE INTERNAL STD. #3			
1455	- -	3	311596.	40.
	2-PROPENOIC ACID, OCTYL ESTER			
1636	2499-59-4	4	2239.	TRACE 0.3
	*** D10-PHENANTHRENE***INTERNAL STD.			
1761	- -	4	270953.	40.
	D12-CHRYSENEINTERNAL STD. #5			
2330	- -	5	200582.	40.
	D12-PERYLENEINTERNAL STD. #6			
2844	- -	6	126229.	40.

ORIGINAL (Red)

SAMPLE ID. 87092507

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE ID. / CAS NO.	STD.	AREA	EST. CONC. PPB
	D4-1,4-DICHLOROBENZENE INT. STD. #1			
803	- -	1	158732.	40.
	D8-NAPHTHALENE INT. STD. #2			
1036	- -	2	216598.	40.
	D10-ACENAPHTHENE INT. STD. #3			
1379	- -	3	230273.	40.
	1-HEXANOL, 3-METHYL-			
1546	13231-81-7	4	4367. TRACE	0.7
	D10-PHENANTHRENE ***INT. STD. ***			
1671	- -	4	237288.	40.
	D12-CHRYSENE INT. STD. #5			
2211	- -	5	92532.	40.
	D10-PERYLENEINTERNAL STD. #6			
2676	- -	6	40206.	40.

ORIGINAL (Red)

SAMPLE ID. 87092508

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STD. (NG/UL) 40. WITH AREA 275570. LOCATED AT SCAN 1755

OTHER COMPOUNDS

SCAN NO.	TENTATIVE IDENTIFICATION	STD.	AREA	EST. CONC. PPB
	BENZOIC ACID, ETHOXY-, ETHYL ESTER			
1474	75333-22-1	1	2290.	TRACE 0.3
	PROPANOIC ACID, 2-METHYL-, 1-(1,1-DIMETHYLETHYL)-2-METHYL-1,3-PROPANED			
1549	74381-40-1	1	107538.	16
	2-PROPENOIC ACID, OCTYL ESTER			
1631	2499-59-4	1	1700.	TRACE 0.2
	*** D10-PHENANTHRENE***INTERNAL STD.			
1755	- -	1	275570.	40.

ORIGINAL (Red)

SAMPLE ID. 87092509

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE ID. / CAS NO.	STD.	AREA	EST. CONC. PPB

NONE DETECTED

ORIGINAL (Red)

SAMPLE ID. 87092510

WATER: COMBINED ACID & BASE NEUTRAL EXTRACT

ORGINAL SAMPLE VOLUME (ML) 1000.0
FINAL EXT. VOLUME (ML) 1.0
EXT. DILUTION FACTOR 1.000
DETECTION LIMIT 1.000 PPB, ASSUMING 1NG/UL D.L. IN EXTRACT
CONC. OF INT. STDS. (NG/UL) 40.

OTHER COMPOUNDS

SCAN NO.	TENTATIVE ID. / CAS NO.	STD.	AREA	EST. CONC. PPB
	D4-1,4-DICHLOROBENZENE INT. STD. #1			
804	- -	1	175944.	40
	D8-NAPHTHALENE INT. STD. #2			
1037	- -	2	248284.	40
	BENZOTHIAZOLE			
1089	95-16-9	2	9769.	1.6
	D10-ACENAPHTHENE INT. STD. #3			
1320	- -	3	278968.	40.
	1-NAPHTHALENECARBOXALDEHYDE			
1405	66-77-3	3	985. TRACE	0.1
	1-NAPHTHYL ISOCYANIDE, 2-METHYL-			
1583	20600-57-1	4	756. TRACE	0.1
	D10-PHENANTHRENE ***INT. STD. ***			
1672	- -	4	280298.	40
	D12-CHRYSENE INT. STD. #5			
2212	- -	5	137772.	40
	D10-PERYLENEINTERNAL STD. #6			
2677	- -	6	61713.	40

ORIGINAL (Red)

SURROGATE AGC (WATER)

% RECOVERY

SAMPLE	2-FLUORO-PHENOL	D5-PHENOL	D5-NITRO-BENZENE	2-FLUORO-1,1'-BI-PHENYL	2,4,6-TRIBROMO-PHENOL	D14-TER-PHENYL
	CLP TARGET LIMITS					
	(21-100)	(10-94)	(35-114)	(43-116)	(10-123)	(33-141)
87092501	71.4	65.8	76.0	75.1	81.5	85.0
87092502	85.4	73.6	88.1	83.1	96.7	90.2
87092503	85.1	69.0	84.6	81.6	98.1	84.8
87092504	84.8	75.2	83.1	82.4	102.9	85.5
87092506	79.8	65.2	73.1	66.3	98.7	88.1
87092508	88.3	70.9	83.6	79.8	95.7	83.1

ORIGINAL (Red)

SURROGATE AQC (WATER)

% RECOVERY

SAMPLE	2-FLUORO-PHENOL	D5-PHENOL	D5-NITRO-BENZENE	2-FLUORO-1,1"-BI-PHENYL	2,4,6-BRO-PHE	D14-TER-PHENYL
CLP TARGET LIMITS	(21-100)	(10-94)	(35-114)	(43-116)	(10-123)	(33-141)
87092505	80.1	74.4	84.9	78.8	75.9	82.7
87092507	82.0	75.8	87.5	76.4	85.1	77.2
87092509	88.3	82.9	90.5	82.4	75.0	64.6
87092510	84.1	79.5	82.6	81.6	91.5	77.9

ORIGINAL (Red)

Matrix Spike Recovery

	% Recovery	
	Sample No. 870925-10	Target Limits Water
Phenol	80.8	12-89
2-Chlorophenol	74.3	27-123
1,4-Dichlorobenzene	61.5	36-97
N-nitroso-n-propyl-1-propanamine	68.8	41-116
1,2,4-Trichlorobenzene	64.2	39-98
4-Chloro-3-methylphenol	85.6	23-97
Acenaphthene (1,2-Dihydroacenaphthylene)	82.6	46-118
4-Nitrophenol	87.2	10-80
2,4-Dinitrotoluene	85.0	24-96
Pentachlorophenol	103.	9-103
Dibutylphthalate	86.2	11-117
Pyrene	88.2	26-127

ORIGINAL (Red)

Quality Control

1. Before acquisition of any samples the mass spectrometer is calibrated using FC43.

2. The calibration is verified by obtaining the spectra of a known compound (DFTPP). All mass assignments and relative abundances are found to be in acceptable ranges or the instrument is adjusted until suitable spectra of the known are obtained.

3. Immediately before analysis each sample is spiked with an internal standard D10-phenanthrene. All quantitation or estimates of concentration are made in comparison to the internal standard.

4. Mixed standards of extractable priority pollutants and CLP Hazardous Substances List Compounds are analyzed before each group of samples. The relative response of each compound versus the internal standard is determined for use in quantitation.

5. For each group of samples extracted a method blank is prepared and examined for laboratory introduced contamination.

6. The samples were spiked with mixture of surrogate compounds prior to analysis. Recovery for each was determined to check for matrix effect.

7. An aliquot of sample 870925-10 was spiked with a priority pollutant cocktail at 50 ng/ug (in the extract) and carried through the extraction and GC/MS analysis. The recovery for each compound was determined to check for matrix effect.

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

REGION 3
Curtis Bldg., 6th & Walnut Sts.
Philadelphia, Pennsylvania 19106

PROJ. NO.: PPL
PROJECT NAME: Pigeon Point Landfill
SAMPLERS: (Signature) non responsive based on revised scope

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	½ gallon ambers	40 ml VOA	1000 ml plastics				REMARKS
													TAG #
MW25R	9-24-87	1215		X	MW 25R	7	3	2	2	8	7	0925	01 B-114663, 54, 55, 56, 57, 58, 59
MW 28	9-23-87	1430		X	MW 28	7	3	2	2	8	7	0925	02 B-114625, 26, 27, 28, 29, 30, 31

NOTE: No identification written on sample containers. Just sample tags have I.D. IR.

Samples received luke warm.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
non responsive based on revised scope	9/24/87 5:00 pm				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[illegible] Roberts	9-25-87 1046		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

ORIGINAL (Red)

3-9331

Office of Enforcement

REGION 3
Curtis Bldg., 6th & Walnut Sts.
Philadelphia, Pennsylvania 19106

CHAIN OF CUSTODY RECORD

PROJ. NO. PPL | PROJECT NAME Pigeon Point Landfill

SAMPLERS: (Signature) non responsive based on revised scope

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	½ gal ambers	40 ml VOA	1000 ml plastic				REMARKS
													Tag #
MW 26R	9-24-87	1330		X	MW-26R	7	3	2	2	87092503			B-114660, 61, 62, 63, 64, 65, 66
MW 27R	9-24-87	1230		X	MW-27R	7	3	2	2	87092504			B-114667, 68, 69, 70, 71, 72, 73
													Note: No Identification written on sample containers. Just sample tags have ID. JR
													No time noted on sample tag B-114672. JR
						Samples received Lake warm.							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
non responsive based on revised scope	9-24-87 1620				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		Janet Robuso	092587 1101		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

ORIGINAL (Red)

3-9326

Office of Enforcement

CHAIN OF CUSTODY RECORD

Curtis Bldg., 6th & Walnut Sts.
Philadelphia, Pennsylvania 19106

PROJ. NO.: PPL
PROJECT NAME: Pigeon Point Landfill
SAMPLERS: (Signature) [redacted]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	½ gal ambers	40 ml VOA	1000 ml plastics				REMARKS
MW50	9-23-87	1530		X	MW 50	7	3	2	2	87092505			3-114674, 75, 76, 77, 78, 79, 80
MW51	9-23-87	1600		X	MW 51	7	3	2	2	87092506			3-114688, 89, 90, 91, 92, 93, 94
MW 29	9-23-87	1600		X	MW 29	7	3	2	2	87092507			3-114639, 40, 41, 42, 43, 44, 45
													Note: No Identification written on sample containers. Just sample tags have ID. JR
					Note: Sample date for sta. MW29 on custody sheet is different than written on sample tags. JR.								No time on sample tag 3-114679 " " " " " 3-114676
													Samples received Lotke warm.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[redacted]	9-24-87 1620				
	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature]	9-25-87 11:15		

ORIGINAL (Red)

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-9332

CHAIN OF CUSTODY RECORD

Philadelphia, Pennsylvania 19106

PROJ. NO.: DPL

PROJECT NAME: Pigeon Point Landfill

SAMPLERS: (Signature)

non responsive based on revised scope

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	Vagel ambers	40ml VOA	1000ml plastics				REMARKS
MW31	9-24-87	1100		X	MW-31	6	2	2	2			87092	3-114646, 47, 48, 49, 50, 51, 52
MW52	9-24-87	1100		X	[illegible] DUP MW52	7	3	2	2			87092	3-114696, 697, 698, 699, 700, 701, 702
MW45	9-23-87	1245		X	MW-45	7	3	2	2			87092	3-114632, 33, 34, 35, 36, 37, 38
													No time on sample tag 3-114638
													" " " " " 3-114649
													note: NO Identification
													written on sample containers.
													Just sample tags have ID JR
													Samples received Lukewarm.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
non responsive based on revised scope	9-24-87 9:45 pm				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) Janet Robinson	Date / Time: 9-25-87 1131	Remarks	

ORIGINAL (Red)

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-9327